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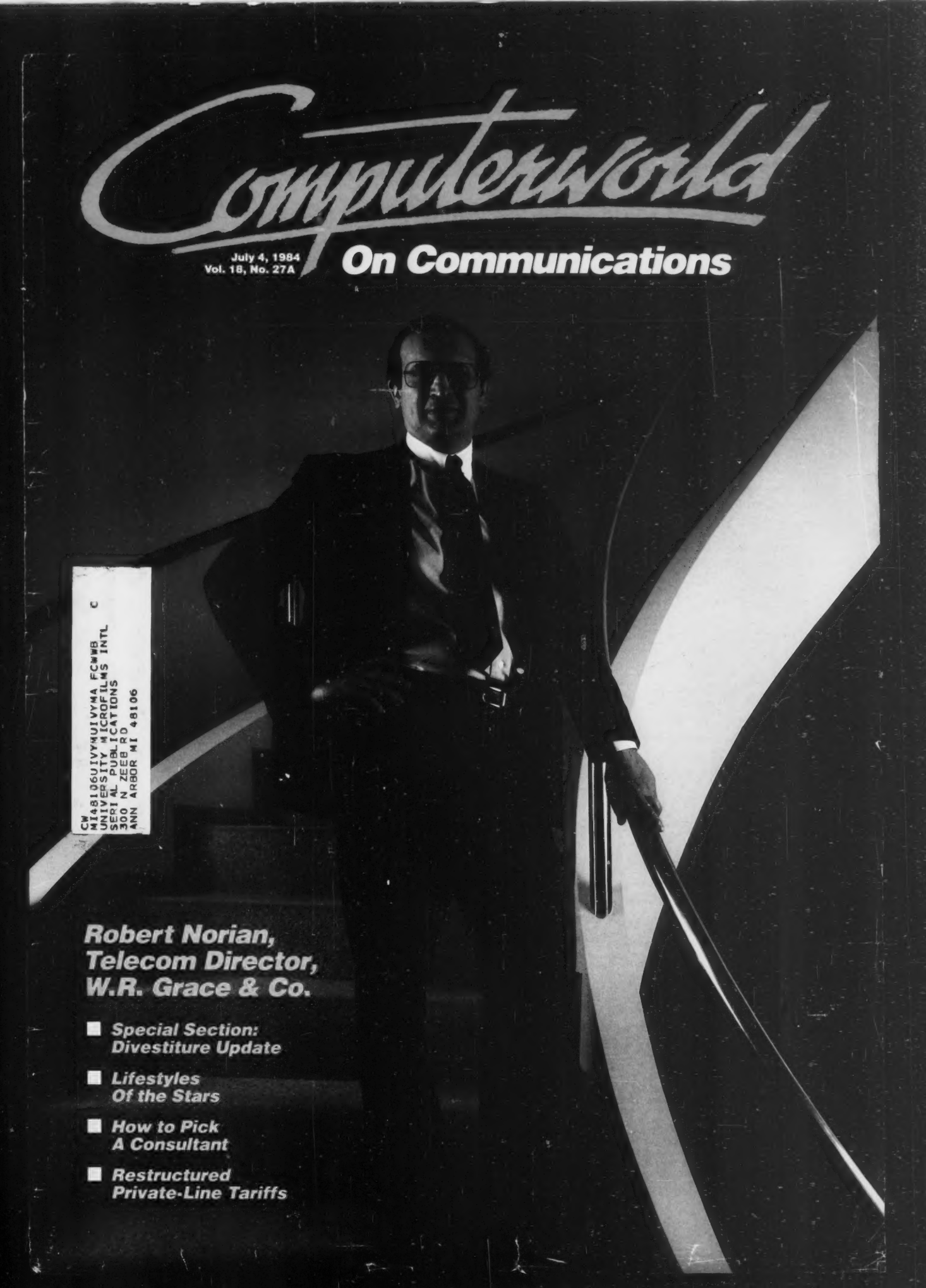

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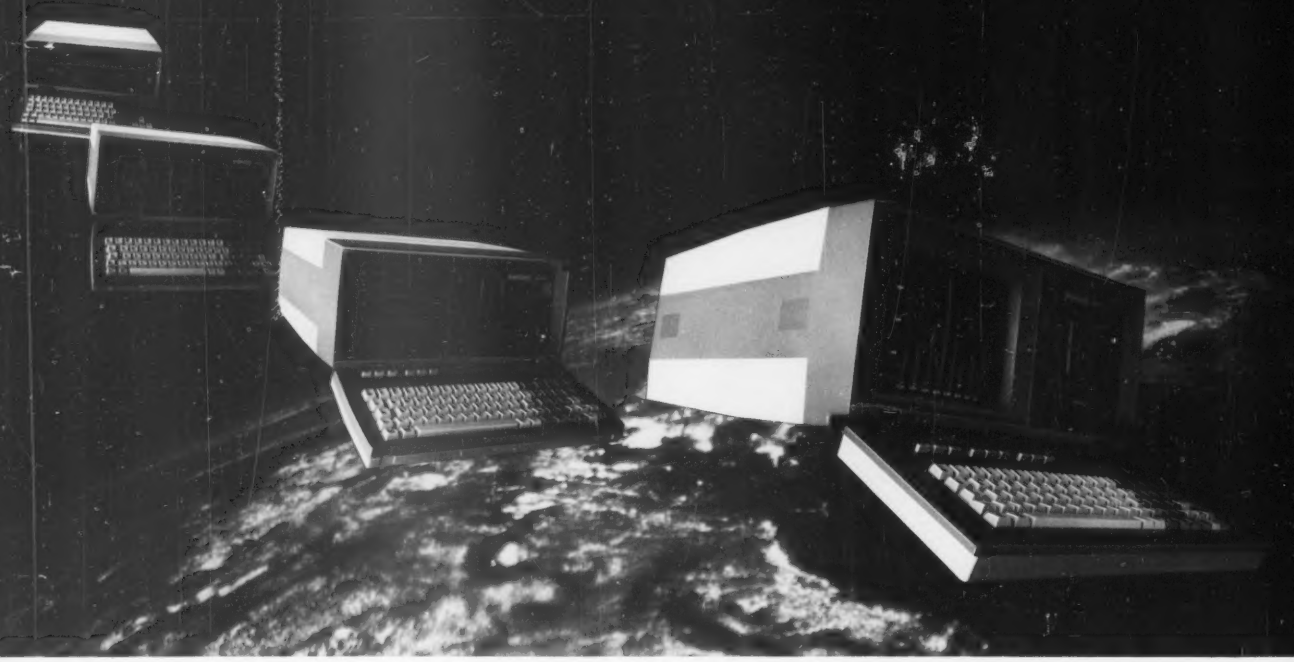

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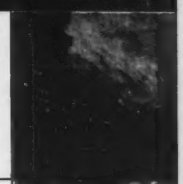

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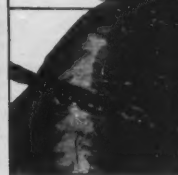

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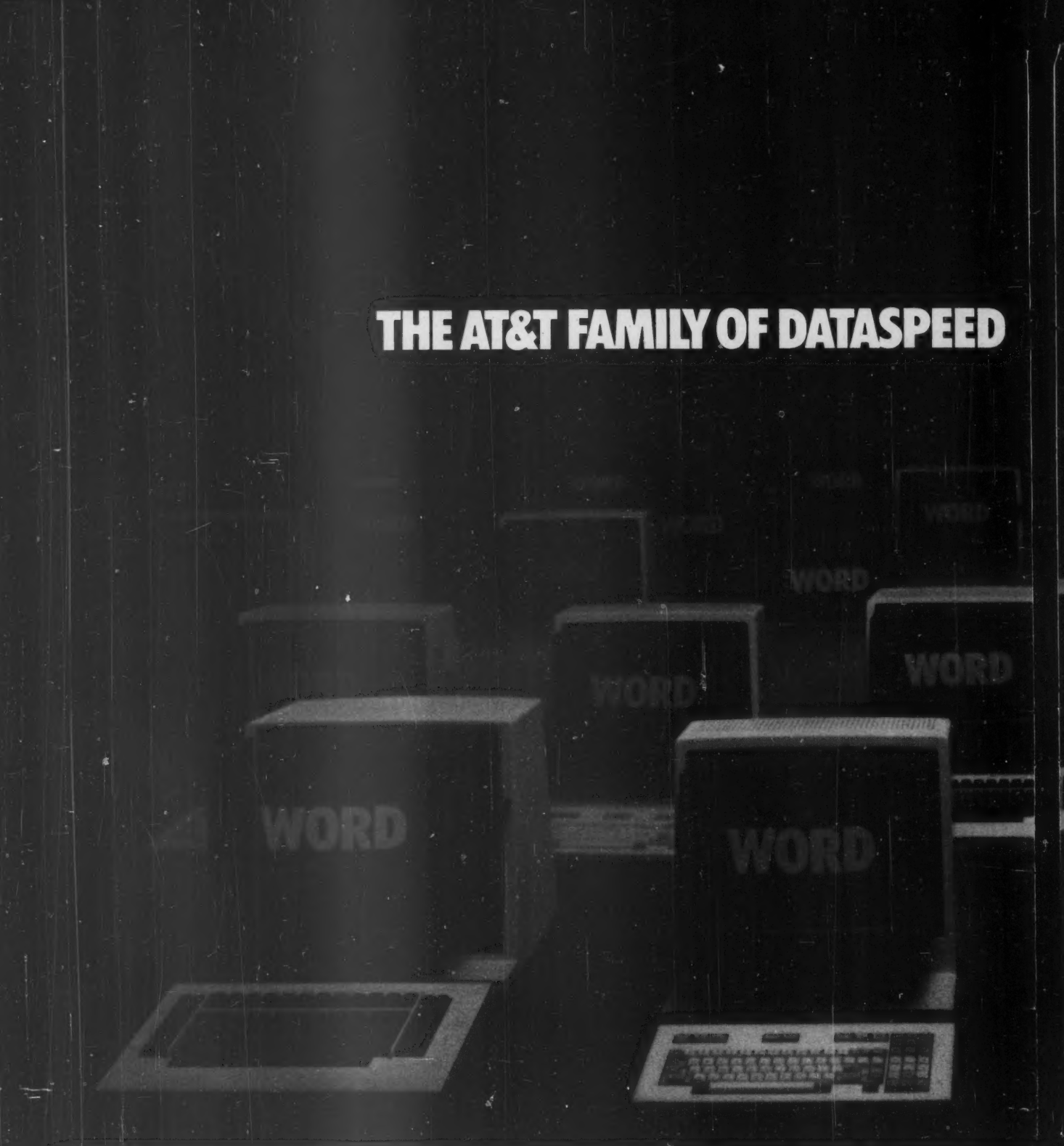

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EDITORIAL

Light at the End Of the Tunnel?

In this issue, we take a look at the state of the communications industry six months after the divestiture of AT&T. Everyone seems to have a different opinion on how things are at this point. Things are either great, horrible, getting worse or getting better.

As far as users are concerned, things are pretty bad. The litany of horror stories is getting familiar by now: the waiting time for lines, the uncertainty over who is responsible for what, the ironic lack of communication between the communications providers.

Unfortunately, the prognosis for the near future is not encouraging. Industry pundits are predicting that the chaos wrought by the breakup will continue to reign for as long as another year, maybe two.

But users can take heart from the way things are going for communications vendors. Aggressive companies like NEC America, Inc. and TIE Communications, Inc. are bringing innovative new products to the marketplace. These products can help users deal with the growing complexity of their networks.

Users have also been benefiting from the competitive environment that was engendered by the Bell breakup. With equal access becoming more and more of a reality every day, the long-distance market is wide open. We have already seen one wave of price cuts, and now AT&T is offering nonbusiness users credits toward consumer goods if they make at least $15 worth of long-distance calls per month.

The regional Bell operating companies have not fared badly. In fact, three of them (Ameritech, Bell Atlantic and BellSouth) fared better than AT&T itself during the first quarter of this year.

The individual Bell operating companies are still in a state of flux. They want to offer protocol conversion within local packet-switched networks, rather than through separated enhanced services subsidiaries. They also want to offer enhanced Centrex service. They need these competitive advantages if they are to deal with the emergence of bypass services.

The jury is still out on AT&T Information Systems. Although the deregulated arm of AT&T has unveiled a raft of new products in the past six months — and even jumped into the computer business with its 3B line — it is still looked upon with skepticism by many who feel the firm has not yet mastered the ins and outs of the competitive marketplace. The delivery of the Dimension System 85 has been very slow, and many experts feel that Net 1000 will suffer the same fate as all its earlier incarnations — extinction.

On the bright side, the System 75 has been warmly received, and the firm has made a positive impression by introducing both a personal computer and a local-area network.

AT&T Communications is feeling the competitive crunch from the likes of MCI Communications Corp. and GTE Sprint Communications Corp. The former Long Lines division has pleaded for total deregulation, but the Federal Communications Commission is not likely to comply so quickly after divestiture — and rightfully so. If AT&T Communications were to be unleashed from regulation at this premature point, it could reestablish its monopolistic stranglehold on the long-distance market.

The fact of the matter is that divestiture is a messy process, and it is currently hurting many of the users it is supposed to benefit. Nonetheless, most of those users who are currently suffering would come forth and say they support divestiture despite its ephemeral inconveniences. We agree.

Computerworld On Communications

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DIALOGUE

Are things better or worse for users six months after the AT&T divestiture?

Dennis Johnston, telecommunications manager, Ebasco Services, Inc., New York:

"Telecommunications users are far worse off. The services have fallen apart. It takes forever to have anything installed. The problem is approaching disaster proportions in some areas. The facilities that we ordered last November are still waiting to be installed. This delay is causing significant problems. You might as well forget about planning to have something installed by a specific time."

Michael Bitterman, telecommunications director, Pepsico, Inc., Purchase, NY.:

"Telecommunications users are not, by any means, better off — they are worse off than they were five months ago.

"However, it would be very easy to blame AT&T and the Bell operating companies for this situation. I don't think this would be fair. The problem is one of the [Federal Communications Commission], Congress and perhaps even the users thinking that they could make the Bell System turn on a dime.

"Over the past 12 months, I've been working with people in the Bell operating companies, AT&T Information Systems and AT&T Communications. Not one of these people hasn't given 110% in trying to get the problems resolved."

Chris Verleye, telecommunications manager, City National Bank of Detroit, Detroit:

"Telecommunications users are better off. The AT&T divestiture has made telecommunications managers take a closer look at their total network. After divestiture, telecommunications users can look at other vendors, products and services offered by alternative long-distance carriers.

"The breakup has also forced telecommunications users to take a look at their entire network as far as new charges for access lines and the [Local Access and Transport Areas] and inter-Lata communications within their state are concerned."

Communications manager of a drugstore chain:

"We are much worse off than we were five months ago. We cannot get anything done. We don't get orders completed on time; nobody knows who handles repairs.

"In data communications, when we try to put in a call on a circuit that is a dial-up circuit, they send out the wrong person first. We may get a voice person, who will plug in a telephone and get a dial tone. He'll say, 'It's okay,' and leave.

"I guess it has promoted the competition that it was supposed to. As far as what it has done to AT&T, they don't know how to compete. They've never had to. I cannot deal with AT&T anymore because its prices are just out of the ball park.

"In time, perhaps, everything will settle down. Today, it is pure chaos. It has put the best telephone network in the world down a couple of notches."

George Hanusbevsky, telecommunications services business manager, University of Rochester, Rochester, N.Y.:

"We are served by an independent telephone company so we really didn't experience any change in service.

"Overall, there is a benefit from the breakup of AT&T in that the divestiture will stimulate competition within the industry. There will be competition for the offering of long-lines services between MCI [Communications Corp.], GTE Sprint [Communications Corp.] and local vendors within the Rochester Telephone Co.'s Lata. Not all of these companies will survive, but the competition between them should help to bring down the rates for these services. This situation is more competitive than the one we had where there was one flat rate that everyone had to pay."

Bill Allgeier, teleprocessing manager, Brockway Glass Co., Inc., Brockway, Pa.:

"I think that telecommunications users are worse off now than they were before.

"I didn't have a contact person before the breakup: All I did was call AT&T and say, 'This is what I want; go and do it.' Now, I have to dig to see which company handles these services. I find that there are so many service offerings from the various companies that it boggles my mind."

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LETTERS

Positive Prognosis

I can attest to the fact that the readership of *Computerworld On Communications* is extensive, widespread and, obviously, anticipated eagerly. Within three days of delivery of the June 6 issue, I had phone calls on it from people in seven different states. The consensus was that you did a good job of capturing the personality of the "silver-haired professional" who was your lead subject.

I am pleased that you wanted, particularly, to feature a woman in this issue and am honored to have been the one chosen. I am sure that there will be many other women on the cover of *On Communications* in the future, equally or more deserving than the first one. I am glad, though, that I had the fun of being the first. Thanks.

The rest of the June 6 issue was pretty good, too. In fact, On *Communications* is always well-written and has a good balance of information for those of us in either voice or data who now have to know more of the other.

Evelyn Olschewski
Director of Communications
Mass. General Hospital
Boston, Mass.

Set the Record Straight

I enjoyed your editorial, "Talk Straight," in the June 6 issue. Your "typical nonanswer answer" could have come right out of some sales literature that I have worked on. And you are absolutely right: It says little. You can be sure I'll think twice before using a statement like that again.

However, it should be made clear that the kind of statement you quoted can serve a definite purpose when communicating a vendor's overall philosophy or marketing thrust. The quote certainly tells you that you are not talking to a manufacturer of standalone word processors dedicated to a limited industry. This is not a matter of mere semantics; there are word processing products geared to lawyers, journalists, home use and so on.

What is required is some real meat inside the wrapping paper. If there are no details to fill out what the quoted statement is implying, then, as you say, it is a "nonanswer." But, if the meat is there, then it is a useful, meaningful generalization that helps set the tone.

In addition, it should be pointed out that all too often, your "nonanswer answers" are in response to such nonquestion questions as: "Tell us about your new product," or "How will you be positioning it?"

So, you want it "straight"? OK, here it is. Straight.

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Bill Siegel
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PRO & CON

MCI and AT&T: Shoot-out in Las Vegas

Six months after the divestiture of the Bell System, the communications industry is still awash in controversy over AT&T's future.

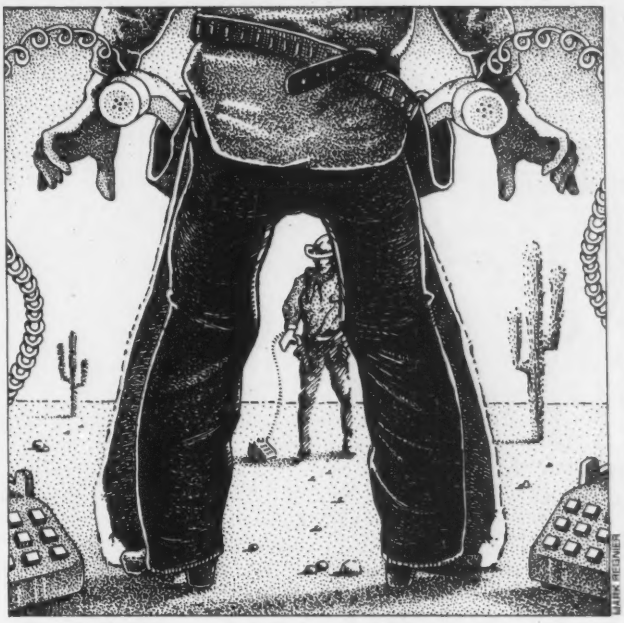
AT&T claims that it has been cut down to size and ought now to be treated as another competitor in the free-enterprise marketplace.

Opponents of AT&T continue to claim that the total deregulation of the former world's largest corporation would thrust it back into a position of monopolistic domination.

At the International Communications Association conference in Las Vegas this May, spokesmen for two companies that have become familiar and seemingly ancient antagonists tangled again over the future of AT&T.

Lawrence Garfinkel, vice-president for service management at AT&T, and V. Orville Wright, president and chief operating officer of MCI Communications Corp., stated their companies' cases at a conference session entitled "The Deregulation of AT&T — Pros and Cons."

Both speeches were cut because of space considerations.



MCI

By V. Orville Wright

Deregulation has evolved over the past decade into one of those beloved American institutions — like apple pie and baseball — that you challenge at your own peril.

So let me say first, MCI Communications Corp. is very much in favor of deregulation whenever and wherever it can accomplish its goal: the promotion of free market competition. To the extent that we can replace regulation with competition, it is all for the better. Consumers and the economy in general should benefit.

The question before us is the deregulation of AT&T. MCI supports the ultimate deregulation of AT&T's basic interstate services. In MCI's view, the key question here is not whether to lessen the regulation of AT&T, but when and how. We feel that premature deregulation would pose a threat to consumers and competition.

MCI proposes the phaseout regulation as the relative market strength of AT&T decreases. It would be useful to take a closer look at AT&T's traditional strengths in long distance.

The monopolistic power AT&T enjoyed for decades in long distance rested on two pillars. The first pillar was AT&T's control of the local companies. This control gave AT&T the ability to exclude competitors by denying local interconnections. The second pillar was AT&T's market dominance, which allowed the company to control prices.

While the divestiture of the operating companies has eliminated AT&T's control over local companies, it has not removed the company's dominance and power in the interexchange market.

Before the advent of competition in long distance, AT&T maintained a 100% market share. By the end of last year, that market share had dropped only about 7% in gross interstate revenues.

In recent public statements, and in filings before the Federal Communications Commission [FCC], AT&T has tried to downplay its true market share by asserting that competition has dropped its domestic toll revenues to only 61% of the market.

AT&T arrives at this dubious figure through a two-step process. First, it artificially inflates the toll-revenue universe by counting just about every long-distance information transfer short of the U.S. mail. It subtracts the small revenue of the other common carriers, private microwave traffic, all intra-Local Access and Transport Area (Lata) calling and even independent telephone company long-distance revenue, most of which is carried by the AT&T network.

Don't be confused by this statistical sleight of hand. By an appropriate measure, AT&T still retains an overwhelming market share — the second pillar of its old long-distance monopoly.

Let's assume AT&T were completely deregulated today. If

(Continued on Page 8)

AT&T

By Lawrence Garfinkel

It is important that we understand and agree on what the attributes of a truly competitive market are, what market forces are to be optimized and what goals are to be achieved. If we do not succeed in maximizing competition, then we will have gone through several rather difficult years and received very little as a result. We should measure those competitive market expectations against the results we are seeing to determine what changes are needed, now and as we progress.

Competition drives prices toward costs. It fosters technological innovation and the rapid development of new services. Competitors force each other to speed new ideas into production and into the marketplace, and customers see increased variety in price and service options. Suppliers increase efficiency as they pursue least-cost technologies — and those efficiencies translate into lower prices for customers.

In other words, true competition — through equal regulation — would bring you all the things you tell us you want from your telecommunications suppliers: greater price performance related to volume; greater stability and certainty in telecommunications planning; experiments with innovative pricing and service offerings; custom-tailored services, contracts, options and discounts.

But the regulatory process — especially when applied in an unequal fashion — delays and distorts vital technological advancement as well as impeding the lower prices and other benefits that naturally flow from technological innovation.

Let me give you some examples. First, there was cellular mobile phone service. That new technology was held from the marketplace for more than a decade while customers waited for an end to regulatory battles.

Second, last June we filed to offer a new audiographics teleconferencing service. This is a new technology that will allow up to 60 customers to create an audio conference without the use of an operator and then transmit graphics among themselves. It was rejected three months later on the basis of insufficient cost support and Federal Communications Commission [FCC] staff preference for a different rate structure. Yet the rate structure AT&T has proposed was the same type competing companies use today.

Third, international video teleconferencing was finally approved last month after nearly a year's wait.

Last year, AT&T sought permission to experiment in three states with new discounted services that would save customers money. Nearly four months elapsed from the day AT&T first filed to offer the discount plans until approval for the experiment was granted.

During AT&T's notice period on the experiment, MCI [Communications Corp.] and [Satellite Business Systems] filed tariffs to offer options patterned after AT&T's experimental plans, and their tariffs were effective in just 14 days.

Not only were AT&T's competitors able to develop and market a competitive response while AT&T was waiting for a tariff, they also attempted to intervene and have the proposed experiment rejected. Once again, the current regulatory situation ultimately affected customers, by delaying a new service from reaching them.

We are trying to bring customers the lower prices and new services promised by a competitive long-distance telecommunications market. But in a market where only AT&T Communications is regulated, the regulatory process becomes a competitive tool. Competitors compete before the commissions and the courts, rather than in the marketplace on the merits of their technology and their competence and ability to satisfy customer needs.

What is also disturbing are the relative prices paid by you, as customers. All of you — whether you

(Continued on Page 9)

MCI *(From Page 7)*
tomorrow, AT&T raised its rates by, say, 50%, how many disgruntled customers could switch to lower priced competitors? If too little capacity exists among the other common carriers to handle a significant percentage of customers seeking alternatives, the dominant company retains market power. That is precisely the case with AT&T.

What are some of these barriers to market entry? Perhaps the most significant is the capital barrier. MCI's capital expenditure budget this year is close to $1 billion. New carriers will need to spend that much and more if they hope to gain significant market share.

Another important and often overlooked barrier relates to access. AT&T continues to enjoy a premium form of access to local exchanges. Competitors cannot currently serve rotary telephones, constituting about half of the market. Nor can they provide 800 service. Other common carrier customers must still dial those 22 to 24 digits to complete a long-distance call. This creates both image and marketing problems. As a result, market penetration is inherently limited until equal access becomes widely available.

The combination of these and other market barriers makes it clear that AT&T will not lose its dominant market power for several years to come.

For this reason, MCI advocates a three-stage relaxation of AT&T's regulatory burden. Each of these stages would be initiated by an FCC rule-making proceeding.

The first stage of the transition, and one which could be initiated this year, would eliminate what we call the "regulatory underbrush." This includes the large number of industry reports required under the current rules. Facility authorization could also be streamlined during this first stage.

The second stage of the transition would deal with rate regulation. This stage could be initiated after equal access has had its impact throughout the marketplace. Once it is determined that AT&T, while still dominant, no longer exerts monopoly power in the interexchange marketplace, the FCC could safely eliminate rate-of-return and cost-of-service regulation of all AT&T services. We feel a reasonable benchmark for this stage might be a drop to between 60 and 65% of the relevant market share.

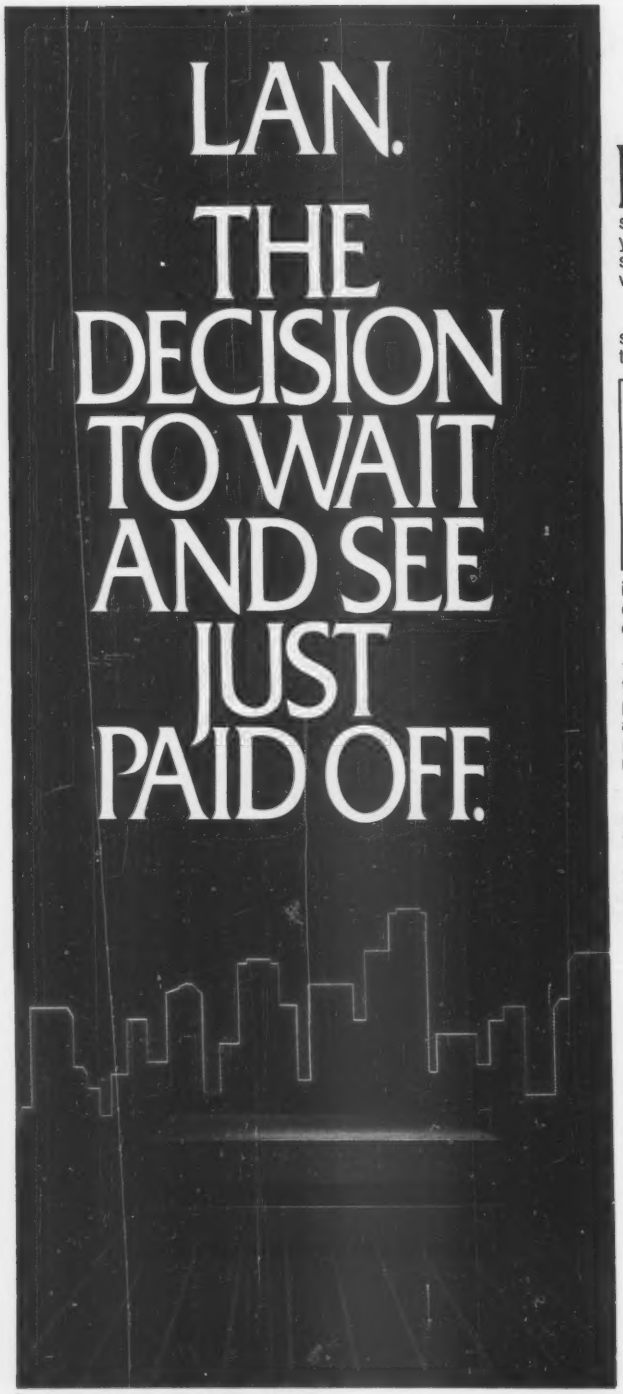
The third and final stage of the transition would be initiated once it can be determined that AT&T is no longer dominant in the market. At that point, the FCC could consider removing regulatory controls over the resale and sharing of services, bundling of services and required interconnections.

Such actions should be tied to a benchmark finding that AT&T's share of the relevant intercity revenues constitute no more than approximately 40% of the market.

At each of these three stages, we feel the FCC should study current market conditions, including the potential market impact of inconsistent state regulation, and then attempt to harmonize regulatory oversight with market power.

We do not feel the FCC should try to select specific services for regulatory change. The relevant product market encompasses all of AT&T's intercity services. Likewise, the relevant geographic market is national. This requires that changes be implemented on a national basis.

By phasing out the regulation of AT&T in this manner, the FCC would retain only those controls needed to address AT&T's market power at each stage of the transition. Such an approach will encourage additional competitive entry without unduly restricting AT&T's ability to respond to that competition.



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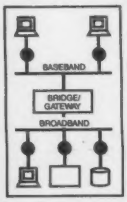

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AT&T *(From Page 7)*
buy from AT&T or from one of the 400-plus competing long-distance service providers — are paying too much.

AT&T's prices are higher than they should be — and higher than AT&T wants them to be. I am sure it is not news to those of you who are AT&T customers that you are carrying a disproportionate load of the cost of providing the nation's telecommunications services through separations. That was part of the monopoly-era system of regulated telecommunications.

No one has seen the full potential benefits of prices moving toward costs. Competitors serve one of every five residential customers who live in target metropolitan areas and who spend $25 or more a month. That 10% of the customer body accounts for about half of all residential interstate revenue.

There is an enormous concentration of revenues and profit that is, in essence, the true competitive market. That is why aggregate market share figures are misleading and represent a static measure of an intensely competitive, rivalrous market. High-volume customers are very price-sensitive. Thus, it has been relatively easy for competitors to capture just the customers they are looking for — the ones most profitable to serve. As a result, competitors are achieving great financial success.

And so you are paying another price penalty. With existing unequal regulation and AT&T's artificially inflated prices, competing long-distance carriers have no incentive to reduce prices closer to their actual costs. They only have to price just below AT&T's prices. And that umbrella pricing arrangement keeps everybody's prices higher than if they were under a system of true market competition. The results of this fact alone are amazing when you look at the profits of some other common carriers.

MCI, for example, has increased its annual revenue more than tenfold in just four years, reaching $1.5 billion in calendar year 1983. MCI's earnings have grown twice as fast, to $170 million for fiscal year 1983. By comparison, MCI's return on capital for the five-year period was 18.2%, Exxon's was 14.5%, AT&T's was 7.4% and General Electric's was 18.3%.

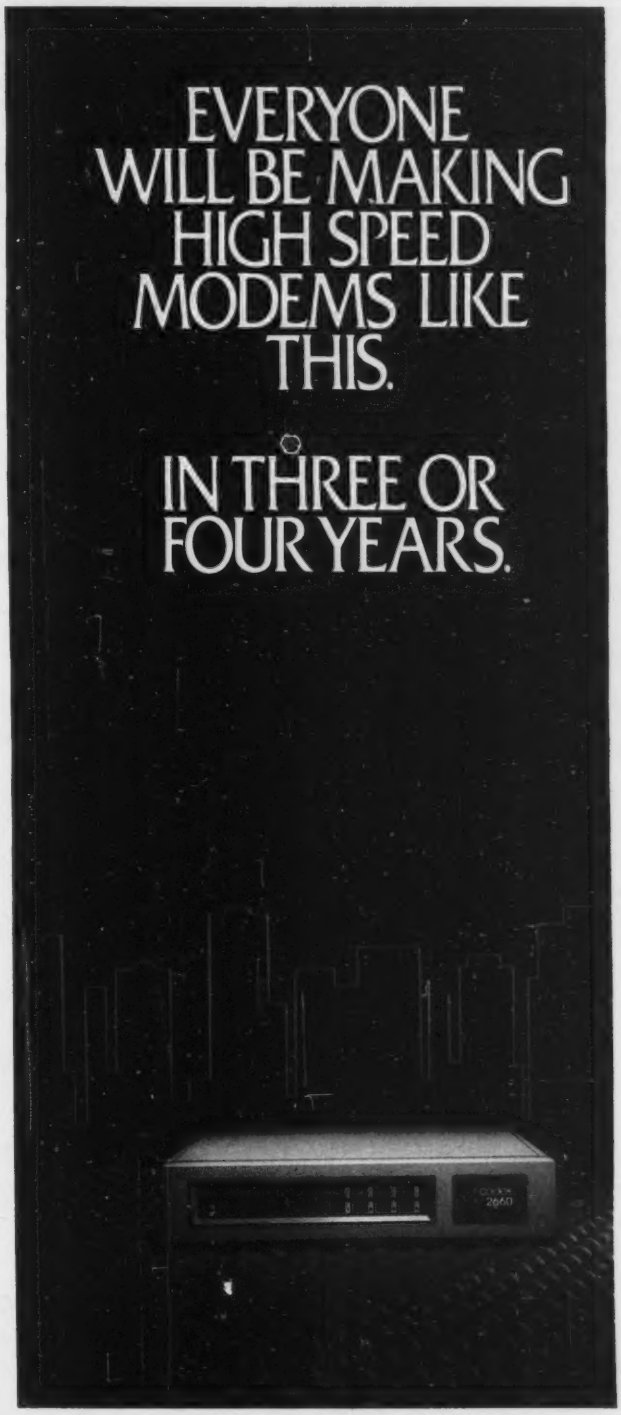
GTE Sprint [Communications Corp.] earned an estimated $70 million in 1983, compared with $22 million in 1981, and $64 million in 1982. GTE paid $727.4 million for Sprint — almost twice its book value. All told, revenues for AT&T's competitors have grown from $270 million in 1978 to about $2.4 billion in 1982 and $3.7 billion in 1983.

AT&T cannot raise prices to improve earnings. It must either reduce costs, flow new services to the market or stimulate growth to improve return. It seems to me that all of these actions are consistent with the imperatives of competition. What is inconsistent with the drive to a fully competitive market is that all customers, even those targeted by MCI, GTE Sprint and so on, still do not get the lowest rates possible.

What we have advocated before the FCC is a change in the regulatory process that applies flexible oversight of AT&T rather than stringent regulation. This is the same process that applies to our competitors: no more, no less.

This is not deregulation because of a recognition that the anachronistic rules established in a precompetition world, some in the 1930s, will no longer suffice. Public policy now favors full, fair competition.

The only way to open the marketplace to real competition is to apply the same rule to all the players: equal regulation for all long-distance carriers.



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In multipoint applications, the Codex 2640 can even handle mixed 9600, 7200 and 4800 bps inbound rates. So each drop can operate independently at maximum speed and efficiency.

Of course, with the Codex 2600 Series, network control is standard. So you can monitor line and modem performance from the front panel or from a central Codex DNCS system. Plus there's an optional downline-loading feature that lets you conveniently modify or enhance the functionality of remote, unattended modems.

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NEWS ANALYSIS

USPS FAILS TO DELIVER ON ECOM

As was shown last month, the U.S. Postal Service (USPS) in the electronic mail business was a bit like King Kong on a balance beam. On June 5, the USPS board of governors directed Postal Service management to file a request to end its floundering electronic computer-originated mail (Ecom) service and arrange for the disposal of the service's equipment.

Conceived in late 1978, Ecom took nearly five years to implement. From the start, the service was a failure, falling far short of its initial anticipated volume of 50 million pieces of first-class mail generated via Ecom annually. The 1983 volume of 15 million pieces fell far short of projection.

In recent months, the service has been losing an estimated $1 on each message it handled. In the opinion of Walter E. Ulrich, president of Walter E. Ulrich Consulting in Houston, Ecom was not only ill-conceived, but poorly implemented.

"Even before it finally became available, it changed five times," Ulrich said. He added that, in the face of this disappointment, it is likely to take "years" before the Postal Service reenters the electronic mail market.

"The best thing the Postal Service can do in electronic mail now is to optimize its physical delivery system and accept hard-copy mail from all electronic mail vendors on an equal basis, then make sure those letters get delivered on time."

OCCs WANT PIECE OF TOLL-FREE PIE

Nobody said the AT&T divestiture was going to be completely fair. In the midst of all the change, AT&T has held on to one of its most profitable businesses — 800 service. AT&T's stranglehold on the service has sparked challenges from both the divested Bell operating companies and the other common carriers, which believe they are entitled to a piece of the lucrative toll-free business.

"It's a mess," Don Gooding, a senior analyst at the Yankee Group, a Cambridge, Mass.-based consulting company, said. "It's one example where lawyers come head-to-head against technology."

The core of the controversy is the 800 service's signaling system. Unlike distinct area codes, which alert the system's switching computers to a particular geographic region, an 800 number tells the system that another party is paying for the call. The 800 network was designed for an integrated Bell System and dismembering, or even sharing it, is extremely difficult. Claiming that it would take two to three years before they could develop a similar network, the operating companies and other common carriers are going to court to gain the right to lease capacity on the 800 data base.

"Competitors should stop complaining that they want to use this data base and get it together and develop their own," Mary Johnston, another senior analyst at the Yankee Group, said. "I view the 800 data base as something proprietary for the Bell System, and the [Bell operating companies] lost their claim to it through the rules of divestiture. It is not a monopoly in the legal sense. The 800 data base is just something no one else has been able to replicate."

LOCAL BELLS SOUND OFF

The Federal Communications Commission (FCC) decided last month to stand by its original ruling that Bell operating companies must market their customer premises equipment and computer-based enhanced communications services through separate subsidiaries.

With the exception of Ameritech, all of the regional Bell operating companies have filed waiver requests for permission to offer protocol conversion within their regulated, local packet-switched networks rather than through enhanced services subsidiaries. At press time, action on these requests was pending.

Pacific Telesis Group, the first to petition the FCC with such a request, wanted to offer protocol conversion for residential and small business users who wish to use the telephone company's planned X.25-based, packet-switched networks with terminals operating on asynchronous protocols. Offering protocol conversion through separate subsidiaries would simply be too expensive to operate and therefore too expensive for the users, according to the various Bell operating companies that filed for the waivers.

While the FCC has stood firm in its ruling, an attorney for the commission commented that the decision still "does not prevent anyone from filing a waiver."

ONE IF BY INTELSAT, TWO IF BY SEA?

The International Telecommunications Satellite Organization (Intelsat), the monopolistic worldwide satellite communications consortium, is facing yet another challenge. In January, *On Communications* showcased opposing sides of allowing a new satellite network, International Satellite, Inc. (ISI), a license to compete with Intelsat.

The latest challenge has already been approved. The Federal Communications Commission authorized eight U.S. companies to join 26 European countries and Teleglobe of Canada in constructing the first fiber-optic, transatlantic submarine telephone cable.

Dubbed TAT-8, the high-bandwidth cable will carry video and data in addition to voice transmissions. Under current law, such enhanced transatlantic services are included in the exclusive domain of satellite communications.

The most notable U.S. participant in the project is AT&T. However, Intelsat officials will recognize TRT Communications Corp., one of three major participants in ISI. The other U.S. participants in TAT-8 are RCA Global Communications, Inc., the Western Union Telegraph Co., MCI International, FTC Communications, Inc., Hawaiian Telephone Co. and ITT World Communications.

The $335-million dollar project will connect Tuckerton, N.J., with Britain and France. It is expected to be completed by mid-1988.

UNGERMAN-BASS, DATAPOINT IN LIMELIGHT

Maybe the local-area network companies decided it was time to get back in the limelight. They had dominated the collective consciousness of the communications world back in 1981 and 1982. Lately, however, local nets seem to have faded while the new generation of private branch exchanges (PBX) get all the attention.

Whatever the reasons, Datapoint Corp. and Ungermann-Bass, Inc., two of the original baseband manufacturers, made news last month. Datapoint, which has been offering its proprietary Arcnet longer than any other local net vendor, announced its intention to open the network to "industry-standard technology."

Edward P. Gistaro, Datapoint president and chief operating officer, explained the move by saying it would allow more users to use Arcnet. A spokeswoman added that the company plans to integrate the IBM Personal Computer into Arcnet in 1984 and that Arcnet can directly use the recently announced IBM Cabling System.

The spokeswoman also said that, while Datapoint will make Arcnet interfaces available for non-Datapoint products, the technology behind the interfaces will remain proprietary.

These announcements come at a time when network integration between various vendors' communications products is becoming the exception, not the rule. Datapoint is still smarting from its PBX failure and cannot afford to lock itself out of the burgeoning office automation market.

Ungermann-Bass entered into a value-added dealer agreement with IBM that calls for the local network maker to remarket IBM's Personal Computer and Personal Computer XT.

Under the new agreement, the local net vendor will add proprietary network management software and an intelligent interface to the IBM Personal Computer products. It will then remarket the computers to end users as part of the Ungermann-Bass Net/One local-area network.

This is not Ungermann-Bass's first foray into IBM territory. Last September, it introduced an intelligent board-level network interface unit for the IBM Personal Computer.

SEC CHARGES DATAPOINT

After a lengthy investigation, the Securities and Exchange Commission (SEC) last month charged Datapoint Corp. with grossly inflating its 1981 sales and earnings.

The San Antonio, Texas-based local-area network and office automation vendor was accused of making premature shipments of products to customers in order to inflate sales figures and even making an unordered shipment.

According to the SEC, Datapoint overstated revenue for fiscal year 1981 by $22 million. During its third quarter that year, according to the 26-page complaint, Datapoint shipped products to Merrill Lynch, Pierce, Fenner & Smith, Inc., which subsequently rejected the delivery.

Datapoint, however, claimed to be pleased with the outcome of an investigation that had been going since May 1982. Jack Milne, vice-president of corporate relations for Datapoint, said — without admitting or denying the allegations made — that his company has entered into a consent decree with the SEC to be enjoined from future violations.

"We regard this as a favorable settlement," Milne said. "The complaint made no allegation of fraud against the company, and it did not require restatement of any of the company's financial statements or previous filings with the SEC."

AT&T USERS CLIP GIFTS

When AT&T starts giving its residential long-distance users coupons toward a variety of gifts just for making more than $15 a month in calls, you know competition has truly come to the long-distance industry.

That was the case last month when AT&T Communications struck back against the raft of long-distance providers nipping at its heels. The company announced that nonbusiness callers will receive credits equal to their monthly long-distance bills, as long as the bills are least $15. There is a long, varied list of gifts offered, ranging from electronic equipment to clothing.

Coming as it does on the heels of May's long-distance rate cuts and at a time when equal access is opening up the industry, this latest development pushes AT&T even deeper into the competitive marketplace it never had to deal with before Jan. 1.

This episode might appropriately be entitled, "How the mighty have fallen." Imagine the haughty, predivestiture AT&T Long Lines offering customers incentives to make long-distance calls. What a difference a year makes.

KATHERINE HAFNER

Why Fix When You Can Nix?

Commensurate with the dip in prices for computer hardware, the cost of communications equipment is falling at a steady clip. That is, communications devices are entering the world of **disposable electronics.**

Modems that sold for $7,000 eight years ago now go for "well under $2,000," according to Gary Audin, president of Delphi, Inc. in Pompton Lakes, N.J.

That is quite a drop. But why?

"The micro has invaded the modem market," Audin explained. "Most decent modems, even the cheap ones, are implemented on a microprocessor.

"Take as an example a little 300 bit/sec modem that sells for under $100," Audin said. "When you look at it, the cost of opening up a piece of equipment for repair is usually a minimum $40 to $80. So here is a case where labor is beginning to exceed the actual replacement cost."

The disposable quality of electronics comes with the "galloping miniaturization" of communications equipment, John E. Dulfer, a telecommunications consultant in Melbourne Beach, Fla., said. "I think 'disposable electronics' is a brilliant term for the impact of these devices on everything, including modems.

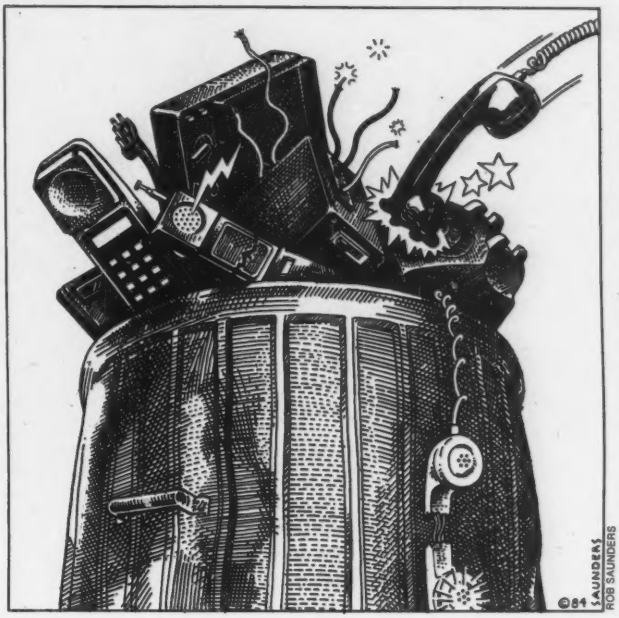
"We find microprocessors embedded in all sorts of things," Dulfer said. "And I extend that to modems because of plans among chip manufacturers to put modems on a chip."

According to Dulfer, the so-called modem on a chip is being developed by Intel Corp. and Harris Corp. by reducing all of a modem's components to large-scale integrated circuitry. For a time, the Canadian government was considering embarking on the development of a modem on a chip.

The most pervasive of the communications devices falling under the disposable label, of course, is the $10 telephone. "Magazines now give you a free phone with your subscription," pointed out Richard Parkinson, a consultant in British Columbia. "Having talked on one of those things, I can understand wanting to chuck it even before it breaks."

But Parkinson is still not a full-fledged subscriber to the notion of disposable communications devices. "If it is a matter of $40, that's one thing," he said, "but if I had a $400 modem, I would want to get it fixed."

In Parkinson's view, it is important to differentiate between the low and high end of the modem product line. "If you look at it from the users' perspective, they will want to have an expensive modem maintained," he said. "If you can hire some worker at $12 an hour to run a test, then it may be worthwhile to fix the board."



According to Audin, disposability extends beyond modems and multiplexers to terminals and even network cabling. "If you look at the terminal world, they have a duty time of two or three years," he said. "The [Radio Shack] TRS-80 portable terminal is $300 to $400 in today's market. In another year, it might be $250 with twice as many features. If it breaks, you could choose to fix it for $100 or invest in a better machine.

"Handheld terminals are going to be as disposable as calculators are today," Audin maintained. "How many people ever really repair their calculators?"

For those who manufacture these products, Audin said, the disposable notion makes for a "sell life of two to three years for a certain product. Every two years or so, they will have to introduce new products. The only way a product will survive is with significantly reduced costs."

Short of planting an egg timer next to every telephone in every office in the nation, there used to be no way of monitoring telephone companies' long-distance charges. But as telephones increase in their sophistication, and more and more key systems include timing features, long-distance customers are spotting **overcharges** in their telephone bills.

The cumulative cost of monthly overcharges can run into thousands of dollars. Not long ago, in fact, a telecommunications manager at NBC told the story of being charged $30,000 by AT&T Communications for the installation of one telephone line. Of course, that is a glaring example of true horror. But the insidious side of the story is the accrual of minor overcharges that can easily go undetected and end up amounting to a lot of money.

One of the most common forms of overcharging is billing a customer for calls that were dialed but never completed. Such charges are nettlesome enough to have inspired lawsuits from several groups of dissatisfied customers.

"[GTE Sprint Communications Corp.] charges people for calls that are not completed," said Gerald Miller, an attorney representing a group of people that is suing GTE Sprint. "We are not suing them for doing it, we are suing them for failure to disclose, because they don't inform the customers they are being billed for it."

The reason that the other common carriers often charge customers for calls that are not completed is that they do not have an answer supervision feature, according to Jason Beckett, an account executive at Interconnect Planning Corp. in Boston. "With answer supervision, the billing cycle doesn't start until someone answers," Beckett said. "The [other common carriers] don't have access to answer supervision, so they give it 10 to 30 seconds, and if the connection lasts longer than that, they assume it has been answered."

Miller's case is currently pending in U.S. District Court in New Jersey, and he expects it to come to trial "in a number of years." According to Miller, approximately 13 similar lawsuits against other common carriers are pending, and the first to be ruled on is likely to serve as a precedent for the others.

A year ago, a communications magazine ran a news brief on CXC Corp.'s **Rose** fourth-generation private branch exchange (PBX). The article led readers to believe that the switch, with a built-in local-area network, would be ready to ship in a matter of weeks. At the same time, *Business Week* published a laudatory profile of the company and mentioned that the state-of-the-art switch would be shipped to customers in September of last year.

Well, where is it?

In the middle of May — one week after the International Communications Association conference in Las Vegas, where the CXC booth was conspicuously empty — the three-year-old company conducted an exhaustive press tour to announce the availability of its PBX. CXC said it will start shipping the switch in June.

CXC, which brands itself as "the office humanation company," has equipped its Rose with a plenitude of communicating bells and whistles. The Rose consists of one to 64 small microcomputer-based switches, each controlling 192 telephone lines connected by high-capacity coaxial cable. The Rose is said to include a proprietary local-area network integrating a 33M bit/sec circuit-switched ring and a 16M bit/sec token ring over 50M bit/sec broadband cable. The system is also said to include store-and-forward messaging for both text and voice mail, gateways to external data communications networks and programmable applications processors.

Claiming that the Rose's shipping dates have coincided with the firm's original business plan in 1981, Robert Hawk, CXC's vice-president of marketing, refused to acknowledge a delay in the product's availability. It had been rumored that development of the Rose was delayed because the custom-made chips from International Microelectronic Products, Inc., another young company in California, were not yet available. When confronted with this possibility during a meeting with reporters in May, Hawk did concede that "chips had something to do with it," an apparent contradiction to his earlier assertion that no delay existed.

Hafner is Computerworld On Communications' *senior writer.*

ALAN PEARCE

CPE Question Opens Up a Can of Worms

What is customer premises equipment?

Both the Federal Communications Commission (FCC) and U.S. Federal District Court Judge Harold Greene are busy grappling with this important question, even though the issue was believed to be resolved by the Second Computer Inquiry and the FCC's landmark interconnect decisions.

The customer premises equipment question is of vital concern to the regional Bell operating companies. More and more regional Bell operating companies are beginning to ask whether the Modified Final Judgment was intended to encompass only those products traditionally thought of as customer premises equipment, or whether Greene intended to open the door much wider.

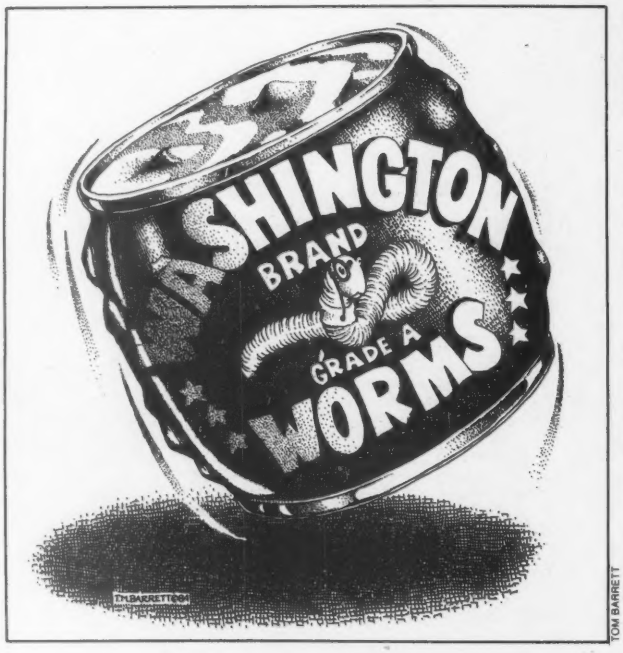
One of the regional Bell operating companies, Nynex, has asked Greene to answer that question and has argued that the customer premises equipment market can no longer be narrowly defined.

Along with Greene, the FCC, which really started the customer premises equipment debate in the late '50s with its Hush-a-Phone decision and continued it in the late '60s with the Carterfone decision, is now locked again in a major debate about equipment.

Among the customer premises equipment inquiries currently under review by the FCC are:

- Docket 73-752, relating to group and supergroup unbundling of customer premises equipment;
- Docket 79-105, considering deregulation of inside wiring;
- Docket 81-216, permitting the customer to provide the channel service unit and network channel terminating equipment for direct connection to digital facilities;
- Docket 83-34, considering whether the customer can provide customer premises equipment for Local-Area Data Transports;
- Docket 83-893, concerning embedded customer premises equipment, its sale and lease and conditions for termination of service;
- Docket 83-115, the decision that required the Bell operating companies to provide customer premises equipment through a separate organization. This decision was strongly reaffirmed on reconsideration, although it is also on appeal to the Seventh U.S. Circuit Court of Appeals in Chicago.

The arguments over customer premises equipment concern regulatory lines of demarcation. In the FCC's Computer II decision — and more recently in Docket 83-115 — the FCC insisted that customer premises equipment could only be provided via a separate subsidiary. The FCC, however, did not define customer premises equipment.



TOM BARRETT

Broadly speaking, FCC policy has attempted to establish rules governing customer premises equipment that would ultimately lead to its total deregulation and maintain maximum separation of customer premises equipment from regulated telecommunications services.

Unfortunately, the FCC is beginning to see that it is difficult to establish a clear line of demarcation in an industry as complicated as telecommunications.

A recent Memorandum Opinion and Order on reconsideration in Docket 81-216 illustrates the difficulties involved in drawing clear lines of demarcation. In its opinion, the FCC reaffirmed its controversial decision that channel service units and network channel terminating equipment used in connection with digital transmission should be classified as customer premises equipment for purposes of both Computer II and Docket 83-115 and should be offered via a separate subsidiary.

This has caused confusion for the regional Bell operating companies because they traditionally offer channel service units and network channel terminating equipment in conjunction with tariffed private-line, digital-transmission service offerings. The operating companies perform a variety of service functions associated with the transmission and receipt of digital information transmitted.

Consequently, the regional Bell operating companies had argued that network channel terminating equipment should be classified as part of the transmission service offering and should be tariffed, despite its location on the customers' premises. Some customer premises equipment manufacturers, while not totally supporting the operating companies' position, did urge the FCC that the operating companies be allowed to continue to offer channel service units and other forms of network channel terminating equipment, without forming a separate subsidiary.

Although the FCC refused to reconsider its earlier decision, it said that it would not apply the separation requirement concerning network channel terminating equipment in an inflexible manner. In its related protocol conversion decision in Docket 80-756, the FCC invited carriers to submit waiver requests that would allow the offering of network channel terminating equipment on an unseparated but detariffed basis.

This was originally thought to be a compromise solution, but it did not mollify the regional Bell operating companies, because the FCC did not set out the criteria on which a waiver would be granted. Thus, the regional Bell operating companies have to grapple with the issue of convincing the FCC that network channel terminating equipment can be offered without the inherent dangers of cross-subsidies and anticompetitive behavior. Since the separate subsidiary rules are based on the assumption that cross-subsidies and discrimination are difficult for the FCC to monitor, the operating companies may face difficulties if they try to convince the FCC and their competitors that they should be granted more flexibility.

To add chaos to confusion, the FCC is reexamining Docket 81-893 — under its postdivestiture review of Computer II —along with related issues concerning deregulation in 83-1147 and 83-1375, to determine whether a separate subsidiary is required given the new industry structure since the breakup of AT&T.

It now appears that the separate subsidiary idea is no longer in vogue. Greene made no mention of separate subsidiaries in the Modified Final Judgment when he allowed the regional Bell operating companies to market, install and service customer premises equipment, though not manufacture it.

The FCC may also adopt a softer policy option in its reconsideration of Computer II, largely because of difficulties experienced with channel service units and network channel terminating equipment. There are signs that a majority of the commissioners are veering away from the separate subsidiary requirement imposed on the regional Bell operating companies, largely because they are laboring under handicaps that have not been imposed on other local telephone companies.

Even though both Greene and the FCC may be more sympathetic to closer integration of the business activities of the regional companies, there is no doubt about the position of the Antitrust Division of the Justice Department. Justice is unequivocally opposed to any relaxation of the separate subsidiary requirement.

The Justice Department is likely to maintain that compliance with any new FCC regulatory guidelines does not necessarily give the regional companies antitrust immunity. The Antitrust Division is on solid economic and legal ground when it argues that when a business is operating in regulated and competitive business areas, the two should be kept as far apart as possible.

There are two reasons for this separation: First, appearances are important. The more closely integrated regulated telephone and unregulated customer premises equipment become, the more the Antitrust Division will suspect that something is going on. Second, the more closely the business activities are related, the more likely there will be antitrust action at some time.

Tough policy questions concerning definition and lines of business demarcation are going to be the hot topics for the next several years in Washington, D.C.

Pearce is president of Information Age Economics, Inc., Washington, D.C., and a regular columnist with Computerworld On Communications.

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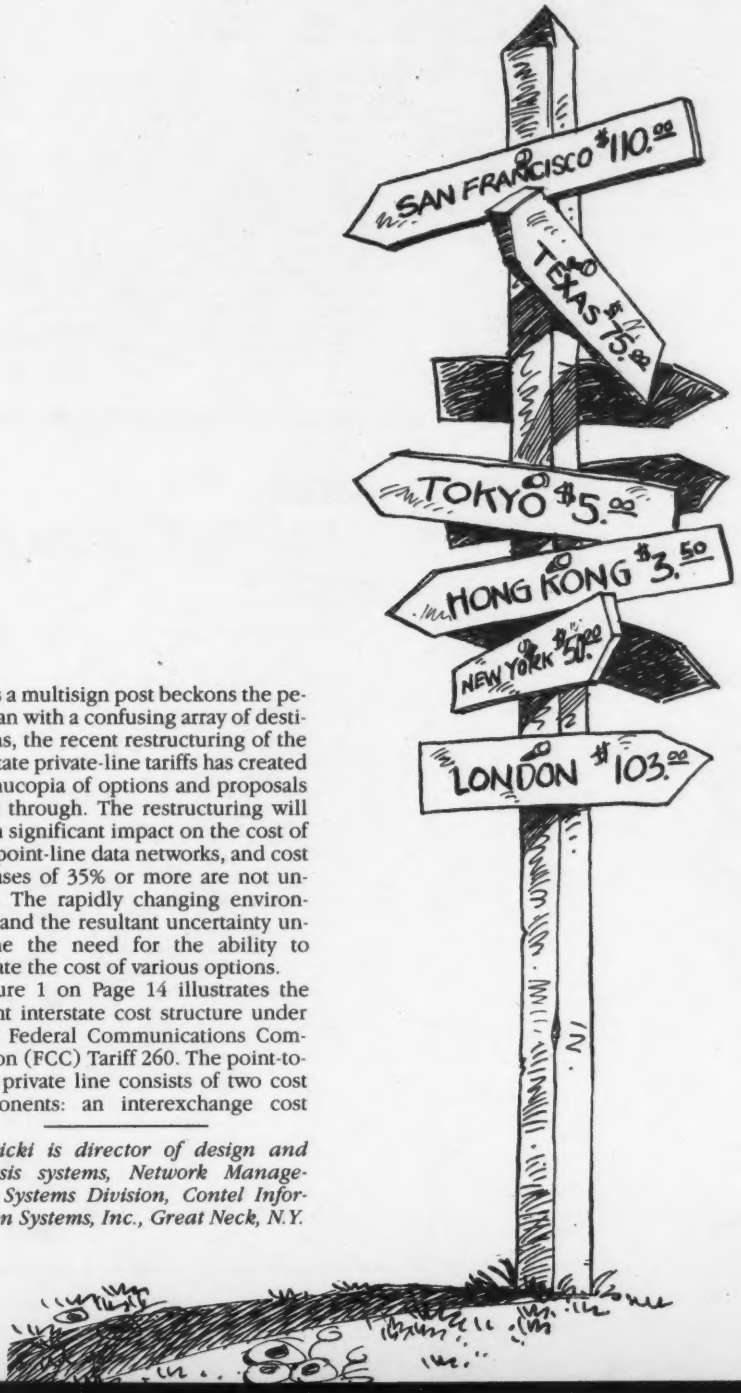
MULTIPLE POSSIBILITIES FOR MULTIPOINT NETWORKS

BY ZVI KOZICKI



Just as a multisign post beckons the pedestrian with a confusing array of destinations, the recent restructuring of the interstate private-line tariffs has created a cornucopia of options and proposals to sift through. The restructuring will have a significant impact on the cost of multipoint-line data networks, and cost increases of 35% or more are not unusual. The rapidly changing environment and the resultant uncertainty underline the need for the ability to evaluate the cost of various options.

Figure 1 on Page 14 illustrates the current interstate cost structure under AT&T Federal Communications Commission (FCC) Tariff 260. The point-to-point private line consists of two cost components: an interexchange cost and a station terminal cost.

The interexchange cost is mileage-dependent. All locations in the continental U.S. are assigned to a rate center, established by AT&T FCC Tariff 274. These rate centers are assigned vertical and horizontal Cartesian coordinates and are used to determine the interexchange cost by calculating the air distance between rate centers associated with the endpoints of the point-to-point line. A tapered, rate-per-mile schedule is applied to determine the actual cost. The greater the mileage, the lower the cost per mile.

AT&T also classifies locations as either A, high-density, or B, low-density. One of three rate schedules is used, depending on classification of the endpoints. The most expensive rate schedule is used for B-to-B lines and the least expensive for A-to-A. Currently, the station terminal cost is fixed at $36.05 per month and is applied to ▶

Kozicki is director of design and analysis systems, Network Management Systems Division, Contel Information Systems, Inc., Great Neck, N.Y.

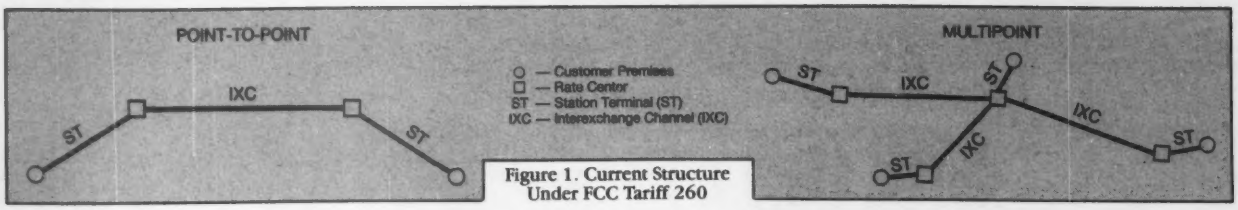


Figure 1. Current Structure Under FCC Tariff 260

each of the two endpoints.

The price of a multipoint line consists of a station terminal for each point. The rate centers are interconnected in a way that minimizes total interexchange costs. Each interexchange cost is determined as if the interexchange channel were a point-to-point line itself.

This pricing structure reflects AT&T's former end-to-end control of service. Divestiture has changed that, and the proposed tariff reflects the new state of affairs.

The country has been divided into Local Access and Transport Areas (Lata). Communications services inside each Lata are provided by the local operating company, which is prohibited from providing inter-Lata services. A new tariff, FCC Tariff 3, has been proposed. Last month, the FCC deferred a decision on the tariff until Nov. 14.

The proposed interstate tariff structure reflects the new environment (see Figure 2). While the current tariff includes two charges, the station interexchange cost and the station terminal cost, the new tariff includes interexchange costs along with three other charges.

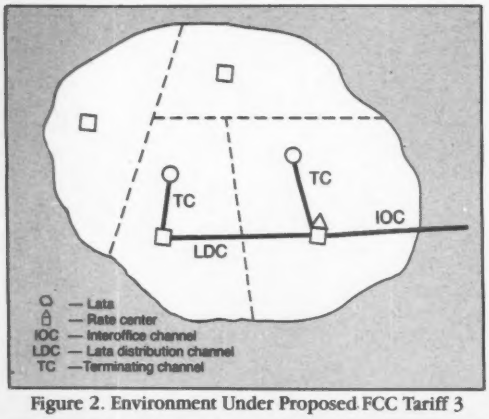


Figure 2. Environment Under Proposed FCC Tariff 3

The cost components of a circuit include a terminating channel that connects the customer premises to a local central office represented by a rate center, a local distribution channel that connects the local central office to the central office associated with an AT&T service office and an interoffice channel between rate centers of AT&T service offices.

The AT&T service office is the point of presence in a Lata from which AT&T provides its communications services. There may be several service offices in the same Lata providing the same service. To determine the local distribution center cost, one would calculate the distance from the customer premises rate center to the nearest rate center with an AT&T service office in the Lata that provides the appropriate service.

AT&T is tariffed to provide two types of service. The first, transport service, is the concept that AT&T is the carrier's carrier. AT&T will provide facilities between service offices.

The kinds of services available with transport service are: 4-KHz voice-grade lines, 48-KHz groups, 240-KHz supergroups and the T-1 terrestrial digital carrier.

There is nothing that prohibits AT&T from providing intra-Lata service, but the service is limited exclusively between the AT&T service offices. Ultimately, responsibility for end-to-end service rests with the customer. Thus, a subscriber to the transport service is responsible for distributing the service from the AT&T service office to his premises.

With transport service, bridging is not available. If a customer wanted to create a multipoint line using transport service, he would be required to provide his own bridging facilities. Equipment sites and the circuit would be priced as configured by the customer. AT&T would provide only point-to-point links.

The second option, total service, is the end-to-end, voice-grade data digital channel, telegraph, wideband terrestrial digital channel (T-1 carrier) and so on. With total service, AT&T does provide end-to-end service to the customers. The multipoint line network is a typical subscriber to total service.

With the total service arrangement, as opposed to transport service, the concept of a multipoint line is included, and the bridging is provided by AT&T. Network configuration and the operation of any particular circuit are also AT&T's responsibilities.

With total service, multipoint lines have the following cost variables:

- *Interoffice channels.* These connect the rate centers of the AT&T service office. The rate structure is the same as that of the current AT&T 260 tariff, except that the notion of A and B cities has been eliminated.
- *Local distribution channels.* This charge applies when the customer rate center is not the service office rate center. Initially, this charge is an averaged, mileage-sensitive rate. That is, the price is averaged geographically, with the same charge being levied in low-density areas as in high-density areas. The charge may be deaveraged in the future, that is, higher charges can be incurred in low-density areas and lower charges in high-density areas.
- *Terminating channels.* Service functions are applied to each terminating channel. These charges are fixed-cost and averaged, but they may be deaveraged in the future.
- *Service functions.* These functions include bridging, conditioning and a basic service function to account for the engineering

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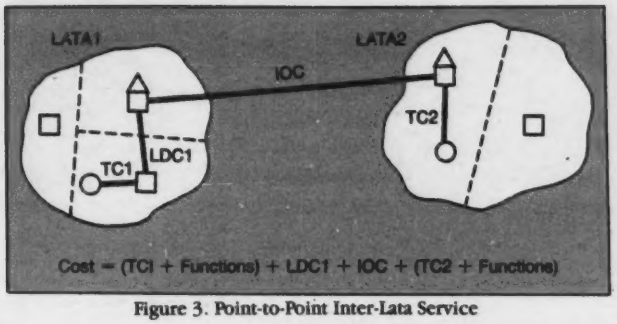

Figure 3. Point-to-Point Inter-Lata Service

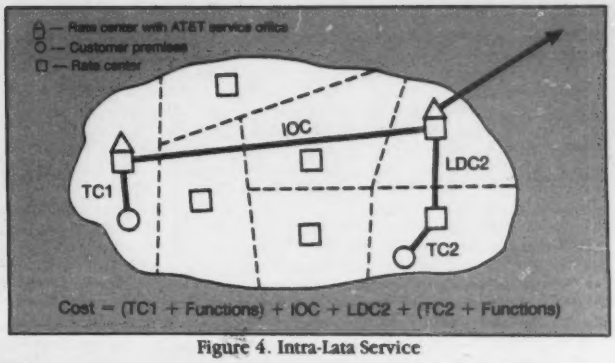

Figure 4. Intra-Lata Service

and maintenance of the network.

The two types of service have various service functions. For transport service, there is a primary service function that is always applied. And there are secondary functions that vary depending on the service needed. These optional secondary functions include equalization and level conditioning for voice-grade only. Total service also has a primary service function that is always applied. It provides more than the transport primary service function.

Secondary functions are also available for total service, depending on the degree of service needed. These optional secondary services include bridging, conditioning and so on.

In addition, each Lata may have more than one service office, and the service offices may be different for each service provided. Figures 3 and 4 illustrate some multipoint circuit examples and the application of the various charges. Figure 3 illustrates point-to-point, inter-Lata total service. It shows a point-to-point line from the customer premises in Lata 1 to that in Lata 2. The total cost includes several variables:

- The terminating channel cost, from the customer premises to the local rate center;
- The local distribution channel cost, from the local rate center to the AT&T rate center;
- The interoffice channel cost between rate centers and;
- The terminating channel cost in Lata 2 from the rate center to the second customer premises. Note that the customer in Lata 2 pays only a terminating channel cost. It does not pay a local distribution channel cost.

Figure 4 illustrates a circuit that is inside a Lata, but with a portion going outside the Lata. In this case, the cost is determined by adding the terminating channel cost, the interoffice channel cost between rate centers, the local distribution channel charge and the terminating channel cost for the second customer premises. It is significant that the station terminal charge of $36.05 per month under the current tariff has been replaced by the sum cost of terminating channels, service functions and local distribution channels in the proposed tariff.

Even without the charge for the local distribution channel, which depends on the distance to the service office rate center, the cost is $143 per month, or a 297% increase in local access costs. This is offset by a reduced interoffice channel mileage cost.

Subsequent to this filing, AT&T declared its intent to eliminate the $25 surcharge on the terminating channels — which corresponds to the well-known access charge — and to taper the rates of the local distribution channel so that longer local distribution channels will have a decreasing

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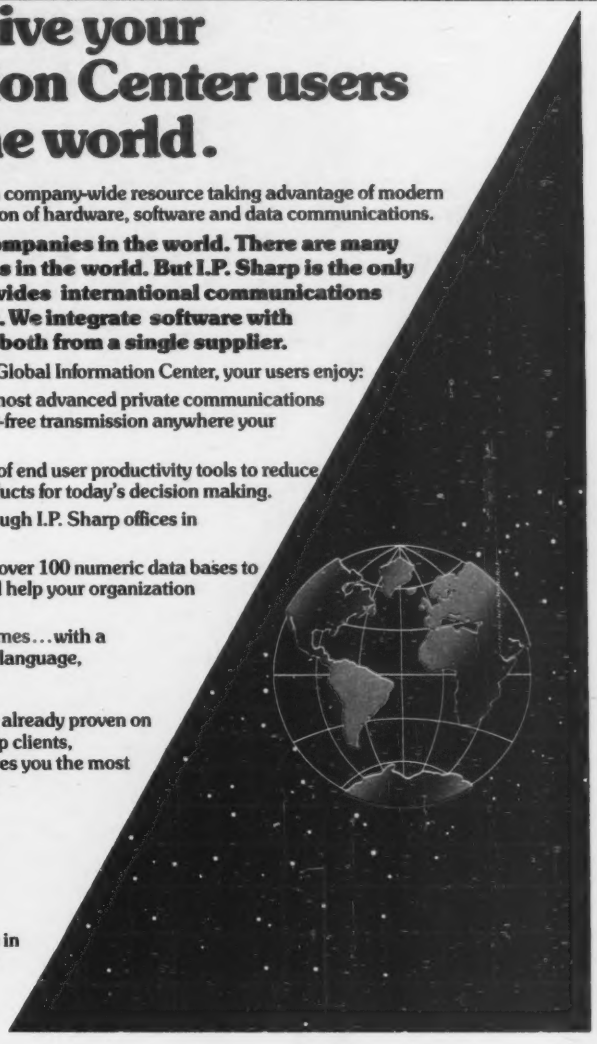

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mileage rate. The local access cost increase remains significant.

Up to this point, the discussion has focused on the interstate situation. AT&T has now become an intrastate carrier for states with more than one Lata. In general, AT&T has filed tariffs for inter-Lata intrastate services that virtually duplicate those of the local operating companies in structure and rates. These are expected to be structured soon along the lines of the interstate tariff.

But what does all this mean to the telecommunications manager? Obviously, no two networks are the same, and the cost impact will vary from network to network. One thing is clear: It is imperative to be able to evaluate the tariff charge and to examine alternative designs. For large networks, this is not easy, unless one has network design tools that can manage a large data volume, one is flexible enough to look at diverse tariff structures and rates and one can produce cost-effective network designs.

In general, AT&T has filed tariffs for inter-Lata intrastate services that virtually duplicate those of the local operating companies in structure and rates. These are expected to be structured soon along the lines of the interstate tariff.

To study the impact of the tariff structures, an analysis was performed on a network of 599 nodes, randomly selected from all the telephone exchanges nationwide. This network should be representative since population concentration and telephone exchanges should be closely related.

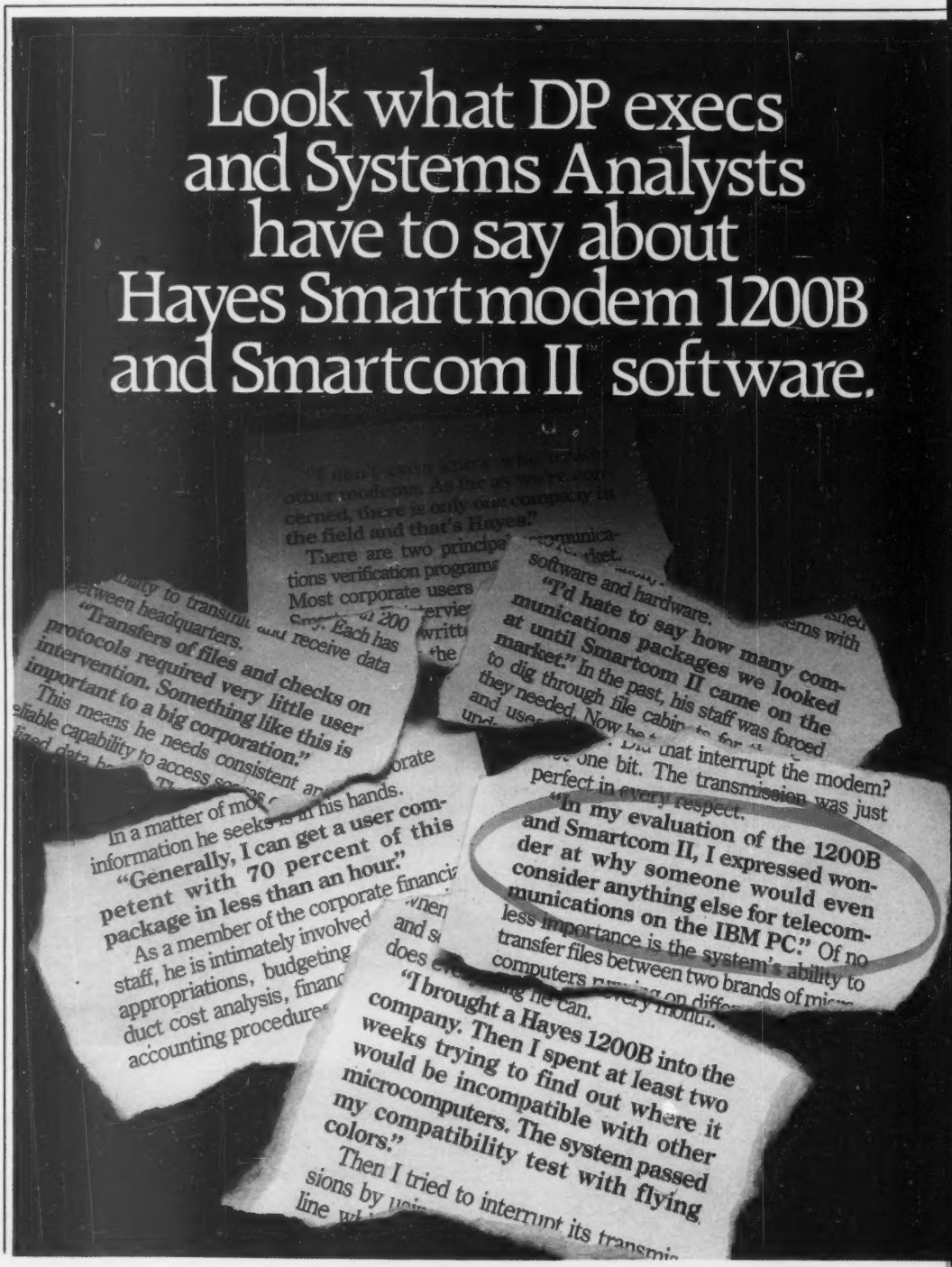
Remote front-end processors were placed in Los Angeles and New York. The location of the host and the trunk network were ignored. It was assumed that there were no more than 10 drops per multipoint circuit. The analysis was divided into six parts:

1. Network under current FCC 260 tariff;
2. Network under proposed FCC Tariff 3;
3. Data digital channel on a subset of the network that has access to the data digital channel;
4. California locations only using the AT&T California intrastate tariff;
5. New York locations only using AT&T New York tariff;
6. Pennsylvania locations only using AT&T Pennsylvania tariff and assuming a remote concentrator in Philadelphia.

The results of Parts 1 and 2 are tabulated in Figure 5. There is a significant shift in network cost from

	Current Tariff	% of Total Network Cost	Proposed Tariff	% of Total Network Cost
A. Interoffice Channel	$155,258	87%	$ 66,753	27%
B. Local Access:				
1. Local Distribution Channel			$ 82,195	
2. Service Functions			$ 26,480	
3. Terminating Channels	$ 23,973		$ 68,186	
Local Access Subtotal	$ 23,973	13%	$176,861	73%
Total Network Cost	$179,231		$243,614	

Figure 5. Network Costs Under Current and Proposed Tariffs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	INTERSTATE	INTRASTATE
A. Interoffice Channel	$ 2,541.00	$4,282.05
B. Local Distribution Channel	$ 2,856.15	
Service Functions	$ 2,000.00	
Terminating Channels	$ 5,150.00	$ 681.87
Subtotal	$10,006.15	$ 681.87
Total	$12,547.15	$4,963.92

Figure 6. Interstate vs. Intrastate in California

	INTERSTATE	INTRASTATE
Interoffice Channel	$ 1,225.15	$17,089.01
Local Distribution Channel	$ 4,167.90	
Service Functions	$ 1,800.00	$ 3,184.90
Terminating Channels	$ 4,635.00	$ 1,120.44
Total	$11,828.05	$21,394.35

Figure 7. Interstate vs. Intrastate in New York

interoffice channels to local access costs. Under the current tariff, interoffice channel accounts for $155,258, or 87% of the $179,231 total network cost. Local access accounts for 13% of total network cost, or $23,973. This local access cost includes only one charge for terminating channels.

Under the proposed tariff, interoffice channel would account for only 27% of the total network cost — $66,753 of $243,614 — and access costs would account for $176,861, or 73% of the $243,614 total network cost. The total local access cost includes three separate charges: local distribution channel charges ($82,195), service functions, ($26,480) and terminating channels, ($68,186).

Interoffice channel costs would be reduced 57%, from $155,258 to $66,753. Local costs would rise an astounding 655%, from $23,973 to $176,861. Overall, the net cost would rise 35%, from $179,231 to $243,614. The data digital channel ratio of local access to interoffice channel would be even steeper but the results were comparable.

Parts 4, 5 and 6 compared the interstate tariff with some popular intrastate tariffs. The interstate cost of an intrastate portion of the network was determined by deleting the intrastate portion of the network and repricing the remaining network. No reoptimization was done, which means that the actual cost of the intrastate portion of the interstate network may be slightly higher.

The results of the interstate vs. intrastate comparisons were dramatic and are tabulated in Figures 6 and 7. In California, the intrastate interoffice channel was about 70% more expensive than the interstate channel. However, after adding local access costs, the interstate cost was about 2.5 times greater than the intrastate cost. The interstate rate was twice as expensive as the intrastate rate. An exception was New York where intrastate costs more than doubled the interstate rate.

While it is very likely that by the time this article is printed, the above results will be significantly altered, one thing is clear. Now, more than ever, it is imperative for the telecommunications manager to be able to investigate alternatives and evaluate design strategies.

The structure of the service offering, while being a product of recent technological advances, will also influence technological implementation. Distributed processing, facility location and advanced network management systems are examples of technologies that have become crucial to the telecommunications manager. ■

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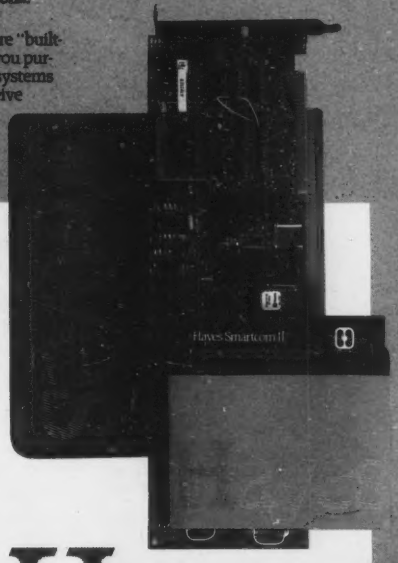

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Litest

AFTER WORK...

BY MARJORIE SEMILOF

Ask nontechnical people how they imagine the lifestyles of high-tech executives, and they are likely to describe souls who are not only robotic wizards, but party pariahs to boot.

Here to help long-suffering technophiles shake this stigma are Gary Audin, John Malone, Dixon R. Doll, John M. McQuillan and Howard Frank. Not only does this group devote an enormous amount of time and energy working the roving seminar circuit, but its members have also managed to find free time and creative ways to spend it.

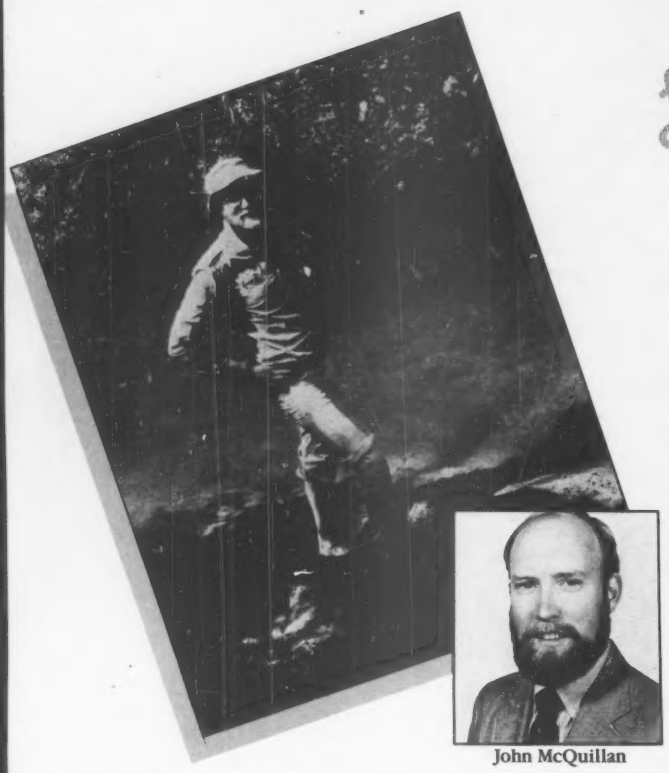
In the past, executives at high-tech companies received the same bad rap as rank-and-file employees: Outsiders see them as leading exceptionally dull lives, primarily because nontechnical people perceive these specialized areas as boring.

Semilof is staff writer for Computerworld On Communications.

On the contrary, consider an observation made by Judy Larkin, an industrial psychologist and associate professor at Canisius College in Buffalo, N.Y. "Anyone with the willingness and motivation to perform tasks that he may not like doing and work his way to the top is not usually a person afraid to take risks."

Larkin, whose studies focus on employees in the computer industry, added, "There is no survey to show exactly how executives in technical fields spend their spare time, but there is also no reason to believe that they would relax differently than anyone else."

Marsha Sinetar, an organizational psychologist based in Santa Rosa, Calif., agreed. "Their brains may enjoy a certain kind of work," she added, "but we all have that little child inside that needs leisure time. These people have learned to cope with stress; they realize that when they do something totally different outside of work, they bring a ▶



John McQuillan

fresh side of themselves back into the office."

Sinetar added that, in general, these executives are also likely to be in better shape physically and emotionally than other employees. They are a disciplined group that may, for example, make it a point to exercise.

This may be surprising, considering the huge amount of stress one could compound shouldering the responsibilities generally linked with their positions as high-tech executives. Sinetar also pointed out that the amount of stress one accrues has little to do with the position that is held within a company. What is important is how each individual responds to the pressure he encounters on the job.

Below is a sampling of high-tech executives who have offered their favorite ways to ventilate. There may be no Acapulco cliff divers on this list, but the members of the group still display enough derring-do to defile the old stereotype.

Lifestyle

IF HE NEEDS a change of scenery, John McQuillan looks for variety. Despite a heavy business travel schedule, schedule, the president of McQuillan Consulting, which plans new computer communications and office automation systems, never tires of taking what he calls a "nice" trip. This time, he's back in his Cambridge, Mass., office, fresh from three weeks on an African safari with his wife.

"I wish I were there right now," McQuillan said. "You can't believe how far away it takes you. The idea of just driving around and looking for animals — and with that spectacular scenery, the wildlife and the bird watching — what could be better?

"I've traveled dozens of times this year on business," he added, "but I don't get to go to Africa. Europe, maybe, but not Africa." McQuillan deserves kudos for bravery, as a portion of the safari was spent on a walking and camping trip that required leaving the security of a game park. Their safe return was entrusted to a guide — thoughtfully armed with a buffalo gun.

"My wife and I packed our high-powered binoculars, telescope and cameras — the works," he added. "We like being brave. It adds to the adventure. We had lions roaring outside our camp. We watched them hunt, and we watched elephants come down to the river to drink."

When the McQuillans want to spend a leisurely afternoon without checking over their shoulders, they can be found in the garden outside their home where the closest carnivore might be a Venus's-flytrap. They have constructed a small greenhouse, where they raise orchids and flowering cacti.

"It's a nonverbal, nonintellectual form of recreation where I can just pay attention to the plants," he said.

"Watching them grow and change gives me something to look forward to and also provides me with a different frame of reference — outside of my business," he said.

McQuillan also spends half his weekends a year at his home on Cape Cod, Mass., where he catches up on a selected armload of mystery novels.

"I guess I should probably do something physical,too — but I'm lazy," he said. "And I don't feel guilty about it either."

He is also looking forward to his next excursion — a summer tour of gardens in England.

"Some days traveling has a lot of appeal," he said. "I sit back and think, who needs computers when there are things as wonderful as taking trips?"

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Lifestyle

HE RACES HIS two Porsches competitively at tracks throughout the country, hang glides and has flown hot air balloons up and down the East Coast. One trip included riding with famed balloonist Malcolm Forbes.

John Malone, founder and president of the Eastern Management Group, likes living on the edge, but admits that his avocations are giving his life insurance company fits.

"My firm is operating at such a fast pace that the pressure really tends to build up," said Malone, who spends almost 40% of his time on the road, making frequent day trips from his Parsippany, N.J., office to clients as far away as California.

The former strategic planner for AT&T estimated that his company is currently growing at about 300% each year and said it has blossomed into the largest research and consulting outfit in the communications industry.

"I'm fairly successful at maintaining an average of 65 hours a week on the job," he added. "When I leave, I have to get totally away from it all."

Although considered an amateur, Malone has been involved in his number one activity, competitive racing, for as long as he can remember. Since he founded the Eastern Management Group, Malone has pursued his interests in racing, hang gliding and riding in hot air balloons with a much greater level of interest and aggression.

Most weekends, Malone shoots away to his home on Nantucket Island, off the coast of Massachusetts, where he is sequestered from office contact — as he tries to be in most of his leisure time. He also manages some time on the golf course and plays tennis, but prefers the mental activities to the physical ones.

"When you're traveling at 140 miles per hour and taking turns at 95 mph, you can't be thinking about what's happening at the office, not even for a split second," Malone said. "It is a good way to do what I want to do and still be able to retain my driver's license."

Lifestyle

HE HAS ONE of the largest collections of science fiction books in the world. The volumes, many of which date back to the early 1800s, fill half of Howard Frank's house, but not half his life, as they once did.

"Five years ago, I did about one-tenth of what I do now," said the president of Contel Information Systems, Inc., in Great Neck, N.Y., of his leisure-time activities. "I guess I became a human being again."

Frank is on a crusade to get physical, and he recently returned from a week at a health spa, where he was finishing eight-mile hikes by 7 a.m.

"There is a new side to me that I don't think a lot of people will recognize, unless you include the before and after pictures," Frank said.

He is a member of Outward Bound, a group of outdoor and nature enthusiasts that organizes various hiking, biking and boating activities throughout the world. The trips, which can last up to several weeks, are physically punishing, but Frank says that there is no better way to get his mind off the office.

"This way I can chuck my brains at the counter and worry about just being alive a week later," he said. "Last October, I spent a week trekking through

John Malone takes a break from adventure.

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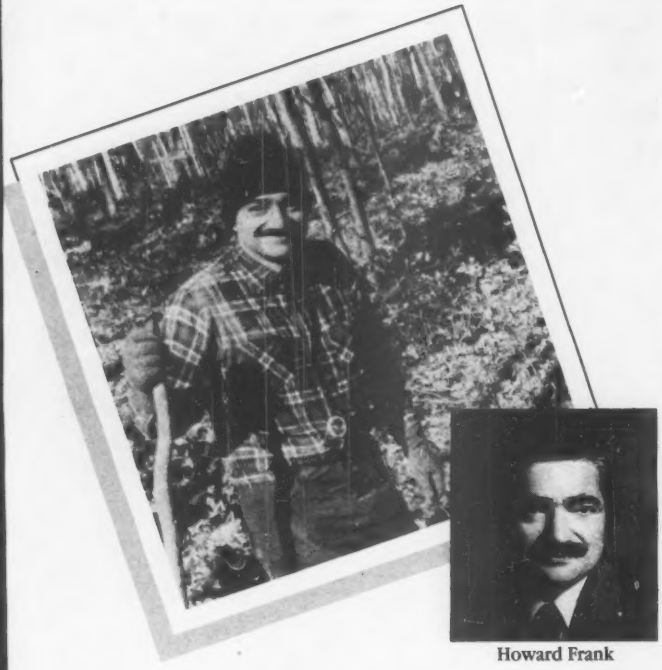


Howard Frank

country in an uninhabited part of Maine. After a few days, my only long-range problem was getting to the top of the next hill."

If that experience was not grueling enough, the next one promises to be. The former associate professor of electrical engineering at the University of California, Berkeley, has already made the ambitious decision to go dogsledding in the North Woods of Minnesota next winter.

"The club trains you in 40 below [zero] weather, and you really do it," Frank said. "When I saw that race on TV from Anchorage to wherever, in Alaska, I thought, 'That really looks like fun.' Those people are crazy."

So the Anchorage-to-Nome Iditarod dogsled race has become his next goal.

"Of course, it's very easy to say that when you are looking out of the window in April," he added, "but I've made a psychological commitment to do the race."

Frank said he is willing to sacrifice the small toe on his left foot as his contribution to mankind — or concession to frostbite — as long as both his big toes and thumbs remain intact.

He is not as extravagant with all his free time, however.

"On most weekends, I simply like to just shop and cook," he said. "And I'm also becoming a clothes hound. It's a retreat into privacy and comfort as opposed to the ruggedness. So I get a combination."

Lifestyle

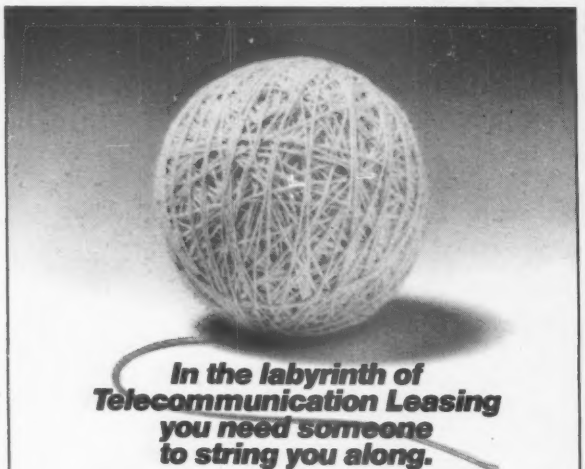
THE QUESTION of how people spend their leisure time is moot if they don't have any. Dixon Doll's daily schedule looks like most people's weekly shopping list. The president and founder of the DMW Group, Inc., logs more than 200,000 miles a year in business travel, which works out to almost eight times around the world, an average of three days and two nights on the road each week. Widely recognized as a telecommunications analyst and author, Doll said that he makes little effort to distinguish between business and pleasure. He does admit, however, to squeezing in some spare time on the tennis court and soaking in the hot tub he recently added to his Ann Arbor, Mich., home.

"My distinction between business and pleasure is different from most people's," Doll said. "Watching my business grow and being active in it is a form of pleasure."

Doll is also an avowed supporter of the University of Michigan and enjoys attending its football games with his three teenage sons. The four have also traveled to more internationally renowned events such as the All-England Lawn Tennis Championships at Wimbledon, England, and football bowl games.

"I play a lot of tennis yearround," Doll said. "And my hot tub is great for relaxing at the end of the day.

"I also recently bought a [videocassette recorder] because I love to watch good films. Right



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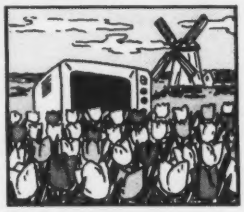

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now, I'm looking at the current goodies and working my way back through the older ones.

"I also enjoy the leisure time I get at work, just flying along above the clouds and talking to other people," he said.

Lifestyle

HE GOT the idea to start his own company when he was sitting in a traffic jam in New York's Lincoln Tunnel.

"I thought, 'Hey, I'm going to try it. But first, I'd better go home and see if I can afford it,' " Gary Audin said.

Five years out of the tunnel, he is the president and only employee of Delphi Associates, Inc., although he does use subcontractors. Audin spends most of his time away from his Pompton Lakes, N.J., office, teaching more than 250 seminars a year on data communications. Known chiefly for his ability to present technology to the layman, his live and videotaped seminars are a popular educational tool for vendors throughout the country. Making creative use of free time in the evening, Audin has a hobby of choosing the oddest restaurant he can find in the city he is visiting.

"The most unusual foods that I have found and enjoyed have been Ethiopian and Afghan," Audin said. "I used to cook Chinese food, but the eating hobby is definitely bigger than the cooking hobby."

When he is not eating, Audin is devouring science fiction novels. His collection currently numbers between 1,000 and 1,500 volumes. "I like the older books, so when I'm away, I spend some time haunting bookstores."

Audin also enjoys what he calls "the history of the world that no one knows about," studying lesser known events, most recently brushing up on Denmark's past. He is a museum fan and pops into exhibits in the cities he visits. He has also made several trips to the Middle East, and last year, he took a cruise down the Nile River and island-hopped through Indonesia.

"Business travel is wasted time unless you do something with it," Audin declared. "If I don't do something productive, that time is completely lost. So I do a lot of walking around cities, visiting friends and reading. I don't think I ever stop working on problems. I just reach a point where I am less conscious of them.

"Why do nontechnical people think we lead boring lives? They feel that to be technical you need continuous concentration on the subject. It's really no different from being a musician. They cannot practice all the time. Even if they did, there would be no significant improvement," Audin said.

"Why do nontechnical people think we lead boring lives? I think they feel that to be technical you need continuous concentration on the subject. It's really no different from being a musician. They cannot practice all the time. Even if they did, there would be no significant improvement.

"I don't want to be in this business too long," he said. "Now, what I'd really like to do is write my autobiography and make a movie of my eight years as a widower, raising my four sons." ■

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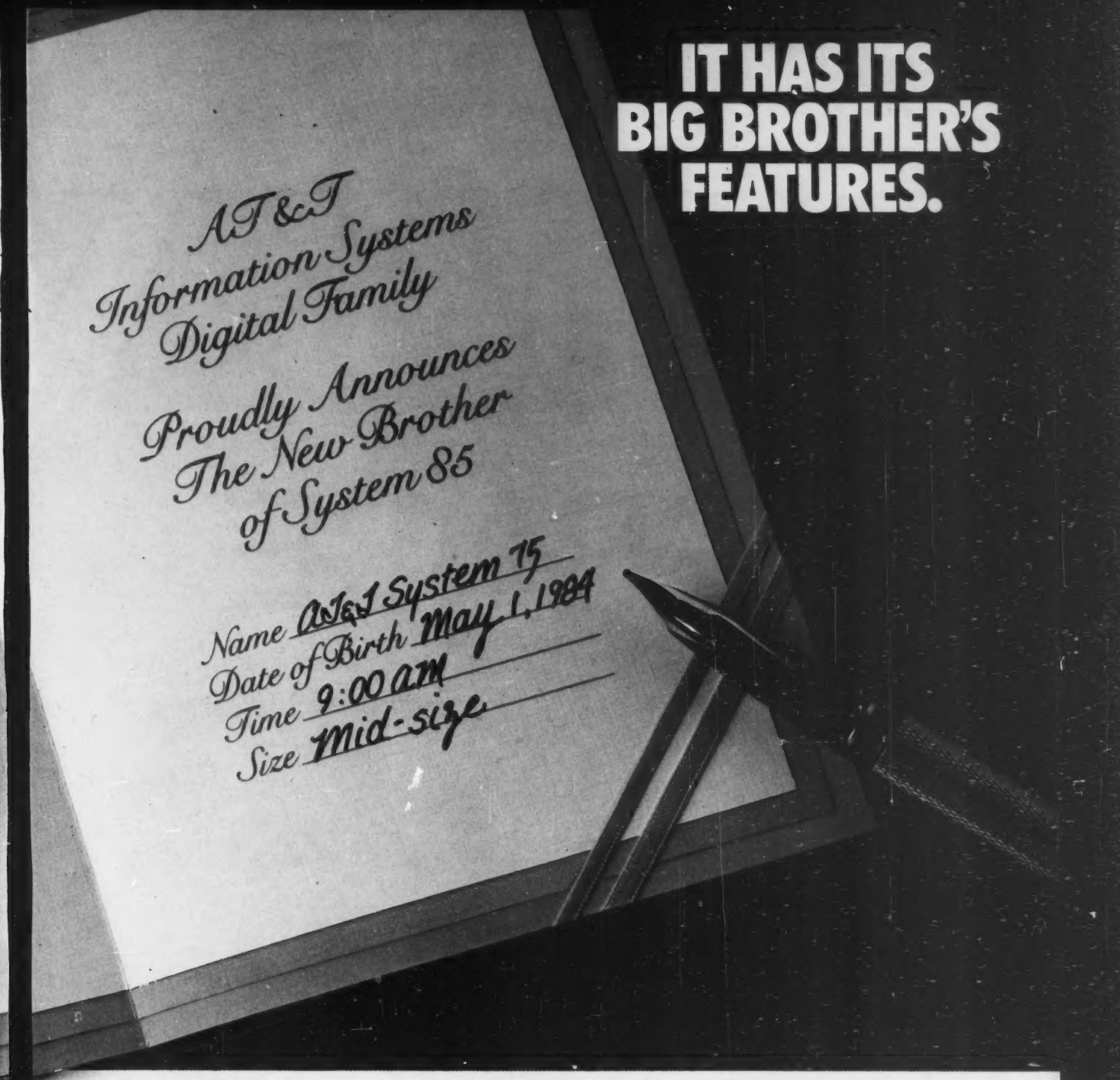

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As you can see, System 75 is not only mid-sized, its prominent features give it a striking resemblance to its big brother. Which is not surprising considering it was developed by systems designers from AT&T Bell Laboratories and manufactured with the same quality and reliability you've come to expect from AT&T.

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Robert Norian is director of telecommunications at W.R. Grace & Co., a diversified $6.2-billion multinational firm that operates in 47 states and 43 foreign countries.

Unfortunately for the sake of simplicity, there is no one master network linking all the far-flung Grace units. Rather, as Norian explains it, there are "pockets" of networks that serve the company's largely autonomous divisions.

Directing both voice and data communications for such a heterogenous collection of networks is no easy task. But the 49-year-old Norian, who was brought up on the data side and learned about voice later, shows no indications of undue pressure. He also thinks it is easier for a data person to learn about voice technology than vice versa.

One of the many articles that decorate his office is a bust of W.R. Grace, the company's chairman. That Norian should have such a bust is no great surprise; that he sculpted it himself may be. Norian is also an aficionado of steam engines and has constructed an elaborate model of one that sits on the table next to his rendition of Grace.

In his New York City office recently, he took the time to talk to On Communications *Editor Bruce Hoard about running the telecommunications show at one of the world's largest companies.*

What are your job responsibilities?

This office, which was started in 1976, is the office of the director of telecommunications. It has primarily been set up as a consulting office for the entire W.R. Grace & Co. The responsibility entails all of voice communications consulting, data communications consulting and the peripheral software in other products. It involves any of Grace's messaging systems, whether telex or text messaging. Telecommunications products that ▶

involve switching or multiplexing are also part of that spectrum.

Staff is limited. There are three professionals, plus secretarial staff. As you can imagine, a tremendous work load is thrown at us. We are looking at about a $30-million annual telecommunications bill for Grace and its various units.

So you are consulting for the company on a worldwide basis?
Yes, we have major investments in the Asian theater, in Australia and also in Europe.

How are your services dispatched?
I would say that we act on a proactive basis and a reactive basis. Approximately 50% to 60% of my time, or better, is spent on reactive programs. If a unit has a problem, needs to get something done, we would make an effort in that direction. The proactive problems are the ones in which we have specific plans that we are involved in. We have proactive plans now with our industrial chemical group to look at its entire networking facilities both in data as well as in voice.

Can you give me an example of a reactive situation?
A reactive program might focus on a unit in the natural resources group that is going to be moving from one location to another and needs to have support in moving its switching equipment or its data communications lines. That gets us involved in a host of things — for example, dealing with our various national accounts if it happens to be a national account product. Reactive problems usually have a a tight timetable. Users call us, but they do not have a feeling for the time requirements of getting things done. That means we have to push to get these things cooking and done in the right time frame.

Can you describe the worldwide Grace telecommunications network?
There is no one integral network for the corporation, whether for data or voice. But we do have multiple pockets of networks, each supporting various business segments. For example, in the U.S., there are at least 15 networks that I can think of that are individually supporting different businesses. Some of them are redundant.

Most of them are applications-driven: That is, they are tied to a series of functions that support the business. That may be an order-entry function if it is a data network, or it may be an order network from a voice perspective. There may be a series of 800 facilities that people are calling, and orders are being taken over the phone and being keyed into displays. So they are supporting specific business applications.

There is a major European network that ties a number of different countries together, and this is part of our industrial chemical complex of organizations in Europe. We operate out of two hubs. One is in France, and the other is in West Germany. This data network supports the order-entry functions of these various companies with two major data centers. It crosses over a number of national boundaries and provides a network and services for these different organizations.

In the U.S., do you gateway any of these independent pockets together, or are they all completely independent of each other?
Usually, they are independent. However, the industrial chemical group has a network set up for its administrative traffic that runs between, say, its headquarters in New York City and other locations like Boston or Baltimore. They hub out of New York on a store-and-forward basis and then transmit to a European point — in this case, it would be in Lausanne, Switzerland. And from Lausanne, it is spread out to the rest of Europe, primarily through the public networks. We also have packet-net utilization in the company. Here in our headquarters site, the various interactive [Digital Equipment Corp.] systems are available through the public packet-switched networks to other Grace locations. We have a [Tymnet, Inc.] engine downstairs that terminates facilities here. So we have that access ability.

Is that access ability also possible between the independent networks?
Any public packet switch is obviously terminal-to-terminal. But if you are talking terminal-to-host, that is a different issue. And here we have one that is supporting our order entry for our book wholesaling business. Most of the other networks are over dedicated facilities and/or analog-switched facilities. There are some plans for modifying those networks to see if we can combine voice and data — for instance, T-1. That is a plan we are thinking about in 1984.

How much of your worldwide network is based on private and how much on public facilities?
There are two ways of looking at it. One is circuit miles, and the other is cost. If you look at it from a cost perspective, you are really talking about the majority being

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Currently, we hear voice is going to be the predominant discipline for years to come. Voice is more than 90%; data is 10%. How do you break that down in your company?
We do have the statistics on that, and I do not think they have changed much, but they have increased somewhat. Data is between 3% and 5% of the total cost compared with voice, so it is very small. It is changing as more and more Grace businesses are becoming more mature in their business cycles. They are putting in place designs that require more data communications. And as a result, that number is going to shift.

Do you have a voice counterpart?
No. I am in charge of both voice and data.

And yet you have a stronger data background than voice. Is that true?
I came from the data side and moved into the voice side.

What problems did that present?
It was a plus because as the technology of switching systems moved from electromechanical design toward computer-driven design, it was a natural evolutionary step. Therefore, the jargon, the understanding of how these things worked was a natural step. It was a comfortable transition.

I suspect that the reverse would probably be a little more difficult for people, and I have seen that. It is a little more difficult for traditional voice people to move into the data sphere.

Do you find yourself acting as an arbitrator between the voice and data sides? Do you have any conflict between voice and data?
Not at all. Traditionally, the data processing department would design its data network and when that required switched facilities, they were shared between the voice people and the data people. They would use a Wats facility during the day for voice, and they would do batch transmissions at night. There were no problems; they worked together well.

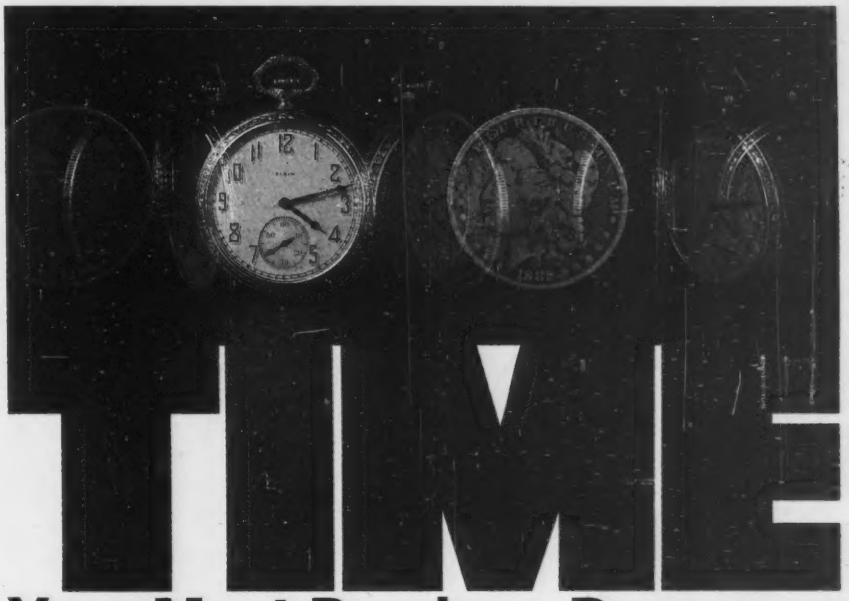
But now voice and data are coming together . . .
But they are coming together primarily in switches that are handling both voice and data. And the design of the networks that connect to them obviously has to be tightened up and controlled better. Since in the corporate office, my prime responsibility was consultant to the corporate group on the switch that we have installed here, the [Northern Telecom, Inc.] SL-1, all of these issues were aired between the various data users and the administrative management. When we put our specifications together, it was understood that this was going to be an integrated voice-and-data design.

Are you using local bypass?
We have discussed local bypass. We have a number of different vendors that are providing us services besides the services from AT&T Communications, which are Wats services. We do use MCI [Communications Corp.] services. We use [Isacomm, Inc.] network services and Satellite Business Systems services.

You don't have a dish on the roof here.
We don't have a dish because we do not have that volume of traffic. That would be for a very high-volume user. We do not have anything near that.

How did you prepare for the breakup of AT&T? When did you start preparing for that?
The answer to that is back when

Norian, the aficionado of steam engines, sculpture and communications



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we first heard that all of this was going to be happening. A year ago, we first wanted to get the full story and impact from AT&T itself. So we set up meetings with AT&T to explain exactly how they were going to restructure our national account. The national account program, of course, was resident in the AT&T Long Lines organization. This involved lines as well as equipment.

What did you tell AT&T?
The first thing we did was say, "What is the impact from your perspective? Come in and tell us all about it," and they did.

Second, they had to get themselves organized with their different teams. The AT&T Information Systems team was organized. The AT&T Communications team was reorganized. As they developed, they kept us informed of what the impacts were going to be. When the major October filing was to take place, we knew immediately what was going to be happening. We had to be kept on top of it all the time; we did not stop with one session. We said, "OK now, based on what the press is saying, we see changes coming down where you come in, and if you have to come in every two weeks or every week, come in and give us an update." And they were very supportive.

It is one thing to be supportive and tell you everything that is going to happen, but what has happened as of Jan. 1? How has it impacted you?
As of Jan. 1, we did have a major set of problems when new orders for our facilities were requested and when changes were requested. For example, where before, an order for a [private branch exchange] and a set of lines took two to three weeks, that order immediately jumped up to eight weeks to 10 weeks. That was a struggle.

The other thing was that we had a number of options on letters of agency. Who did we want to handle what? We had to get that going because orders from our national account team and the communications area to various regional Bell operating companies were not being honored. So we defined letters of agency so they can have the power to make the regional operating company be responsive. This took some time.

What is the letter of agency?
A letter of agency essentially tells the unit with which you are dealing to honor all order requests and changes that a third party is going to make in your behalf. There are all kinds of caveats you can put in, based on the particular job. You can make it open-ended or wait until further notice.

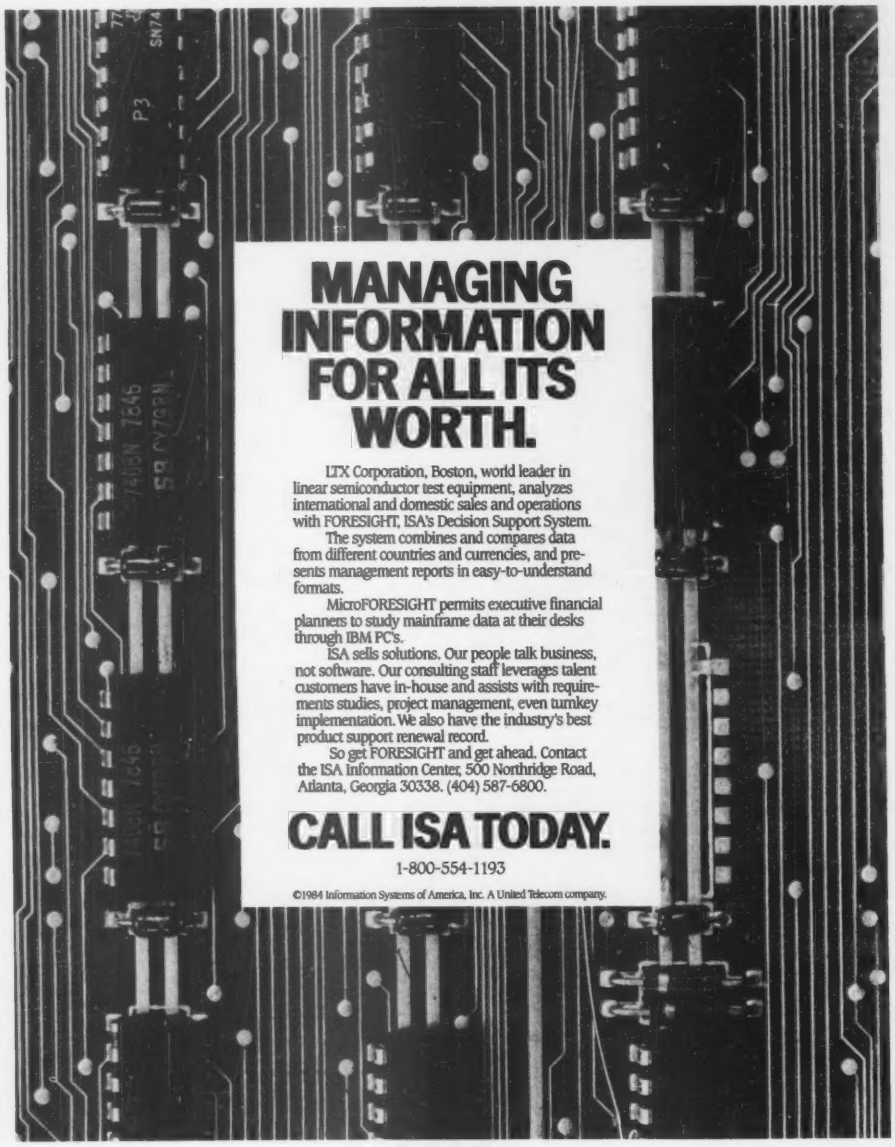
We had a recent problem where we had a multidrop data networking application in which a site in Denver was one of the middle points in the drop. The site in Denver moved from one address to another to another very close by. It took five weeks just to get the order honored. And then to get it processed and actually done took an additional number of weeks. That would never have happened in the prior arrangement. But again, it is a process.

How can you avoid such problems?
It has caused us to provide appropriate backup plans. For example, if you have to move a fixed length from one location to another, always make sure that you have some kind of dial-backup capability. If it is going to take longer than you expected, you have some ability to continue your business, and you are not going to lose your business because of it.

We talked about the problems since Jan. 1. What kinds of opportunities has the breakup of AT&T presented to you?
It has certainly given us a lot more vendors to do business with. It has given us a much broader spectrum of options as far as companies are concerned. I think it was correct to do this kind of a breakup, because we feel competition is going to stir more imagination and is going to get a greater set of minds thinking. I see the breakup as being in the best interest of the telecommunications user. But for the first few years, you will see this tangled web until people start to get firmly on their feet and understand what businesses they are in.

If you were advising someone just out of school who was thinking about making a career out of telecommunications, what would you say to that person?
As a matter of fact, that has happened over the past couple of years. People have come in and said to me, "Shall I get into this business?" I've always responded in the affirmative.

In my mind, information flow and information itself are really the key. How does information flow from Point A to Point B, and how is information made available so people can conduct business? It is going to be done with some teletransportation mechanism, and right now, the word is telecommunications. If they can get into that portion of the business, they will be an important and useful commodity throughout their careers. They will never be wanting a job, and whatever job they do get will be challenging. ■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CALL IT TELETHIEVERY

BY BOB WALLACE

You cannot get something for nothing. Or so AT&T would have you believe concerning the issue of calling card fraud. There are, however, a growing number of people who have been practicing fraud, cheating carriers out of millions of dollars of revenue each year.

And when the cost of an illicit call cannot be collected, as is frequently the case, the uncollected revenue is simply applied to the phone company's rate base. Hence, the company's customers foot the bill for this illegal activity.

Calling card fraud is a mobile crime. A defrauder could conceivably commit the crime any number of times, from any number of pay phones, anywhere in the nation before his actions could be detected.

This form of fraud offers a high degree of anonymity, which nurtures and perpetuates the problem. Unlike other criminals, the calling card defrauder rarely comes face-to-face with his victim. When a calling card defrauder commits his crime, there are no shots fired and no hostages taken. No black-and-whites screech up to the pay phone for the arrest.

Committing calling card fraud requires only that the prospective perpetrator procure a calling card number. This task can be accomplished by:

- Stealing a calling card;
- Buying a calling card number from a reseller;
- Listening in when a caller reads a number to an operator at a public phone;
- Obtaining the business or home phone number of someone likely to have a card and then guessing its four-digit code number.

For the past several months, newspapers have been full of telephone bill horror stories in which Mr. and Mrs. Average Size Phone Bill are suddenly billed for a vast number of calls originating and terminating at points all over the world. The March 1984 account of a Bedford, N.Y., woman who received a 2,578-page phone bill via UPS for $109,500 drew national attention to the growing issue of calling card fraud.

AT&T Communications has been hit hardest by calling card fraud, having sustained losses totaling $108 million in 1983, a dramatic 36% increase over its 1982 calling card fraud total of $69 million. AT&T Communications is pumping $26.5 million into its fraud detection and prevention programs this year.

Although AT&T is constantly introducing newer and more elaborate anti-calling card fraud weapons in its war against calling card defrauders, the fact is that tracking and catching ▶

Wallace is a staff writer for Computerworld On Communications.

these anonymous criminals is next to impossible. Stories of such instances are about as rare as unicorn sightings.

The Bell operating companies have also incurred significant losses of revenue as a result of calling card fraud. Bob Morrow, spokesman for Southern Bell, said that Southern Bell's calling card fraud figure jumped from $6.7 million in 1982 to $9.8 million in 1983. Morrow viewed the problem as "relatively small in relation to total revenue, but still of major concern."

Independent operating companies have also been plagued by calling card fraud. Southern New England Telephone (Snet) spokesman Mike Gomez said, "It is not a big problem, but calling card fraud is of major concern."

Snet grossed $400 million in long-distance revenue in 1983, of which $2.1 million was attributable to fraudulent calling. Half of this $2.1-million total fraud figure was attributable to calling card fraud.

Therefore, only a quarter of 1% of Snet's 1983 revenue was the result of calling card fraud. "We would be foolish," Gomez added, "to admit that $2.1 million is not a lot of money."

Tracing the roots of the calling card problem is as difficult as tracking the defrauders. Neal Norman, AT&T district manager of corporate security, maintained that the problem started when the first calling card was issued, but added that the problem intensified just as AT&T solved bill-to-third-party fraud, the practice of illegally billing the charges of an operator-assisted call to an unsuspecting third party.

This type of fraud has diminished substantially as a result of relatively new validation procedures that require operators to contact the third party for call verification before connecting the call.

AT&T's bill-to-third-party abuses totaled $69 million in 1982. This figure plummeted to $32 million, a 53% decrease, for 1983 and is expected to drop further this year. Gomez reported a more pronounced drop in bill-to-third-party fraud after Snet implemented verification procedures for these calls in July 1983. According to Gomez, 50% to 60% of Snet's "total fraud figure in 1982 was bill-to-third-party fraud. But in 1983, this percentage fell to a mere 5% of all fraud."

AS BILL-TO-THIRD-party fraud became more difficult, defrauders migrated to calling card fraud. "We squeezed the balloon one place, and it came out somewhere else," Norman said. By placing restraints on bill-to-third-party calls, AT&T put hoards of potential defrauders out of business. At the same time, however, AT&T made charging calls to third parties less convenient for those who had done so legally. These developments, in the eyes of the telephone companies' marketing departments, justified an escalation in the distribution of calling cards.

"We increased the number of customers receiving our calling cards when we tightened up on third-party billing. The card was a marketing tool," Snet's Gomez explained. "We took a look at individual businesses with a large volume of long-distance calls, businesses that we thought would find it useful and efficient to have such a card."

The breakup of AT&T complicated the situation dramatically. Prior to divestiture, there was only one Bell System. The Bell operating companies' calling cards were all customers needed to charge calls. The breakup separated the Bell System into AT&T Communications and the 22 local operating companies. The local operating companies had already established a base of customers with calling cards, whereas AT&T Communications had not.

AT&T Communications responded by issuing 47 million calling cards this past January. AT&T spokeswoman Patty Wainwright explained, "The cards were issued to all those who already had local company cards as well as to those who, at one time or another, had requested the convenience." She stressed that none of the cards was unsolicited.

The sheer number of cards issued escalates fraud. As one industry spokesman remarked, "The more cards you have out, the more are likely to be stolen."

John Reddy is a district marketing manager with Bell Communications Research, Inc., known as the Central Services Organization before the AT&T breakup. Bell Communications Research is the central research and support group jointly owned by the seven regional Bell operating companies. It provides primarily technical support to these companies. Reddy has tracked major developments in AT&T's war on calling card fraud back to 1982.

"In 1982," he explained, "the calling card had a 14-digit format. The first 10 digits were the user's area code and telephone number. The last four digits consisted of a

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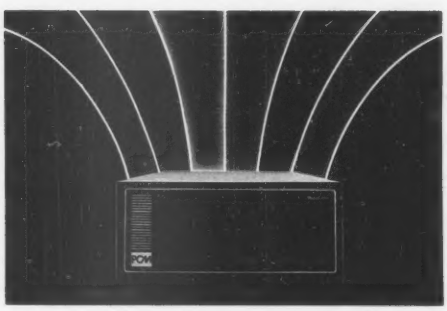

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three-digit code that corresponded to the identification code of the regional accounting office that handled your account and a simple, single-digit mathematical algorithm of your seven-digit phone number."

This AT&T "code" had inherent shortcomings. "It was a relatively simple matter for a crook to get a good, working 14-digit number," Reddy added.

"The crook looked up John Doe in the telephone book to get the first 10 digits. Then he could find out, without too much trouble, the three-digit code of the regional accounting office. Everybody in that [regional accounting office] had the same three-digit code. Now the crook had 13 of 14 total code digits. All he had to do was to figure out the algorithm digit, which wasn't too difficult."

EARLY IN 1983, AT&T effected two changes — one format modification and one technical modification — which it hoped would substantially inhibit the ability of calling card defrauders to crack the AT&T card code. AT&T's original calling card problem was described by Reddy as being a little fraud spread over a lot of cards.

"It was easier to compromise a card," Reddy explained, "so a thief wouldn't stick with the same card."

AT&T changed the four-digit regional accounting office code to a four-digit randomly assigned personal identification number, "a system used widely by banks," Reddy said.

AT&T's second undertaking was to modify the switching machine that handled calling cards to accept a customer's keying in his 14-digit number himself. This advantage eliminated the need for the customer to verbalize the number to the operator, thus eliminating the opportunity for potential defrauders to overhear and compromise the number from an adjoining booth. This service enhancement applied to all Touch-Tone pay phones, from which Reddy claimed 60% of all calling card calls originate. This technical innovation was completed nationally in June 1983.

"The fraud dropped for a short while, but we soon noticed a significant number of fraudulent calls, generating primarily in New Jersey, Miami, New York City, Haiti, the Dominican Republic and Columbia. These calls had been billed to Canadian calling cards," Reddy said. "We honor their cards in the U.S., and they honor our cards in Canada. The Canadian calling cards were still being issued on the old regional accounting office format," he added. The Canadians did not abandon the regional accounting office format until November 1983.

Despite AT&T's efforts to thwart calling card defrauders, it was not putting too much distance between itself and the defrauders. The scope of the problem had changed from being a case of a little fraud on a lot of cards to a situation, by the close of 1983, where there existed a tremendous amount of fraud on a few cards.

The time element played a prominent role in the design and implementation of AT&T's recent anti-calling card fraud safeguards. Calling card fraud's mobility creates a myriad of logistical nightmares for those responsible for creating a practical early warning system capable of detecting calling card abuses before it is too late.

"If a calling card is issued from New England Telephone in Boston, but is used in San Francisco to call Miami, you have to get the billing information from San Francisco, where the call is rated, to the New England Telephone office in Boston," Reddy said. "Five or six days might go by before the report appears in the Boston office. By that time, thousands of dollars worth of fraudulent calls could have been run up on the card." Hence, there is a need for an early warning system.

(Continued on Page 35)

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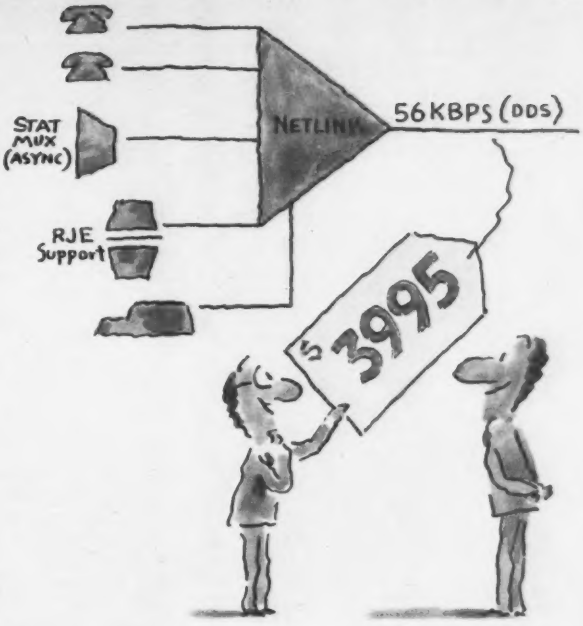

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AT&T, Pacific Bell Draw the Line on Fraud

There are two major problems concerning calling card fraud. First, the defrauder does not need a stolen card to place a fraudulent call — only its number. The second problem concerns how to prevent, or reduce, trafficking of a stolen card number.

AT&T Communications' remedy for the first malady is a phone that requires a user to insert either his card, which features a metal strip similar to that found on major credit cards, or an American Express card into a slot on the telephone. Forty-eight Card Caller Phones are currently in operation at Greater Cincinnati Airport. AT&T Communications plans to install 5,000 more of these telephones at public locations such as airports, hotels and convention centers by the end of 1984.

There are two major advantages of the Card Caller Phone. First, an AT&T or American Express card must be used to place a call. Second, because the card must be run through a slot on the telephone, potential defrauders who have a number but not the corresponding card are rendered powerless.

The chief drawback of these telephones is that installation will be restricted to public places with heavy traffic. They will not be installed in stand-alone telephone booths; a defrauder without a card would be shut out of the heavy-traffic locations, but could still use most public phone booths.

Pacific Bell has been far more successful than AT&T Communications in dealing with the second dilemma: how to prevent defrauders from reselling calling card numbers. It recently developed a hard card, a calling card featuring a metal strip, which omits the user's four-digit personal identification number, according to Pacific Bell spokesman Scott Smith.

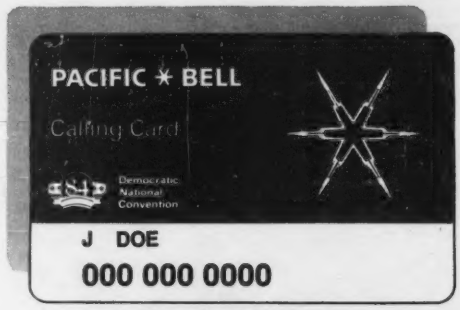
The AT&T Communications hard card lists the user's full telephone number and personal identification number. Combined, these two numbers comprise the full code needed to place a call. If one of these cards is stolen, the defrauder can use it himself, while reselling the full code a potentially infinite number of times. Like the television shampoo commercial spokeswoman who tells only two friends, who tell four friends, who tell eight, the defrauder can sell the stolen number to one or two people and touch off a potentially gargantuan fraudulent reselling scheme.

A defrauder who steals a Pacific Bell hard card can use the card himself, but cannot resell the full code because only a portion of this number sequence is listed on the card. This development should effectively limit the number of fraudulent calls charged to any single stolen hard card.

Pacific Bell made a pitch for the new cards to customers subscribing to service at the Democratic National Convention in San Francisco and at the Olympic Games in Los Angeles. According to Jo Ann Siebe, Pacific Bell product manager for calling cards, the company expects to have issued about 2,000 cards at these events. They were designed to complement Pacific Bell's credit card telephones, the installation of which began in June at airports in San Francisco and Los Angeles. These trials aimed to evaluate customer satisfaction and test the cards' safety features, Siebe said.

And Smith added, "We are definitely going to expand the user base of the cards."

— *Bob Wallace*



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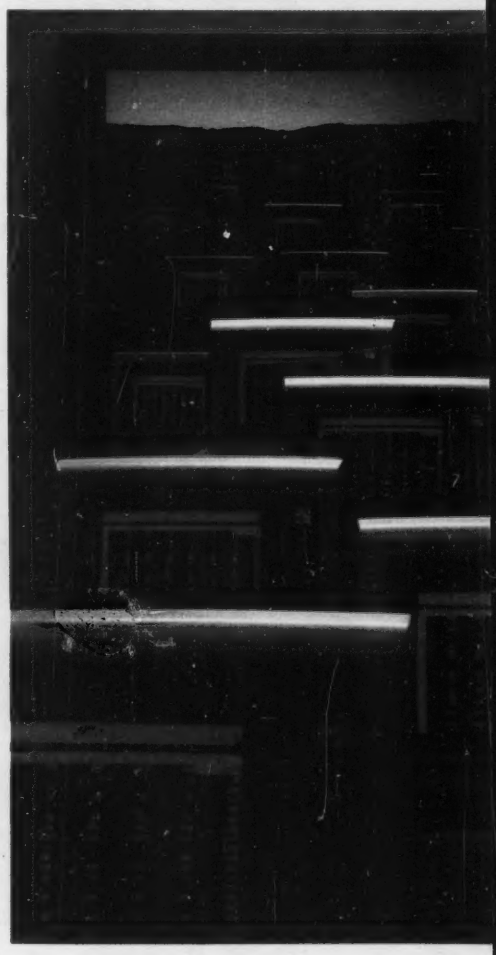

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(Continued from Page 33)

"We took a look at the calling patterns of each of the nation's regional data bases," he explained. "Each data base has a memory of all calling cards that are issued within its respective geographical area. Each time you use a card, the number is routed through your regional data base. We wanted to set a flexible threshold so that each time a card exceeded the upper limit, a report would be generated."

AT&T Communications' Calling Card

The data base manager receives a report on any card that is used excessively. He then passes this information along to the service representative at the regional business office handling the account.

The service representative contacts the customer and asks if the high frequency of calls on his card is legitimate. If the answer is no, the user's four-digit personal identification number is terminated and replaced with a new one.

Since the code on both AT&T Communications' and the local operating companies' cards is the same, in such a situation it would be the local operating company's duty to invalidate both cards. This procedure is not as complicated as one would imagine. Although the data bases were an asset assigned to AT&T at the time of the breakup, they are a shared facility. The data base is managed by the local operating company. The local operating company would simply access the data base, and terminate both card numbers.

The rule concerning whether to invalidate a number when the user cannot be located is: Terminate first, ask questions later, because he who hesitates is defrauded. "If we cannot locate the user, say he is on vacation, we terminate the number. When the user tries to make a call on the number, he will be instructed to contact his telephone business office to receive a new four-digit code number. Otherwise, we send him a registered letter with the new number," Reddy said.

According to Reddy, this system was installed in New York on April 11 and was completed nationally on April 27. He is optimistic that this system will succeed but appears uncertain about its potential life span.

The rule concerning whether to invalidate a number when the user cannot be located is: Terminate first, ask questions later, because he who hesitates is defrauded.

"This system should help stop the horrendous number of fraudulent calls on single cards," Reddy said.

"But I am sure they will come up with something new to hit us with. We are into electronic technology now. It takes a while for the crooks to figure things out, but they quickly do. We are trying to stay ahead of them," he explained.

The question of whether to print the user's area code and phone number on the card typifies the feeling that you're damned if you do and damned if you don't. AT&T's long-standing practice has been to print the entire code on the card.

Many industry skeptics feel that this practice creates more problems than good. AT&T spokeswoman Wainwright defended this practice, maintaining, "This procedure had been followed by the [Bell operating companies] for a number of years. When our marketing department was designing the AT&T Communications card in November 1983, it decided to continue that method for the convenience of the customer."

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the corporate network out of control.

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If you do print the user's area code and phone number on the card, and the card is stolen, the defrauder has all the information he needs to place fraudulent calls. But if AT&T Communications were to omit the area code and telephone number from the calling card and the card were stolen, it seems safe to assume that the card would be stolen along with a wallet or purse. The crook would need only locate a piece of identification bearing the victim's address. He would then simply consult the telephone book for the information omitted from the card.

Although the actual deterring strength of printing only the four-digit calling card number appears to be impossible to gauge, one local operating company, New York Telephone, has opted to switch to this format. AT&T's Norman said that the four-digit format is one of several variations that AT&T is actively considering.

Most industry pundits agree that the way calling card users treat their cards is a major issue. The feeling is that customers do not view their calling cards as seriously as they do their major credit cards. "People have to start treating these cards as credit cards and be careful with them. We cannot stress this point enough," AT&T's Wainwright said.

Snet's Gomez echoed Wainwright's sentiments. "Customers do not really understand that calling cards are like currency." The calling card should be as protected and used as carefully as an American Express or Visa card because, "it's money in your pocket," Gomez said.

Surprisingly, no plans exist for the creation of an advertising campaign designed to push these points across to calling card holders. Although some local operating companies prefer bill inserts to extol the virtue of caution when using a calling card, many rely solely on publicity generated by recent media coverage of the calling card fraud issue to accomplish this goal.

"I think that the large amount of publicity from the news stories about the dramatically overcharged bills is starting to get the idea across that these cards are currency," Gomez explained. ■

MCI Aims To Cut Crime

MCI Communications Corp. spared itself the years of growing pains that AT&T experienced during its struggle to develop effective calling card safeguards. It adopted a simple, commonsense approach for ensuring the security of its customers' 65,000 travel cards.

By listing on their cards only the local telephone number needed to gain access to the computer, MCI made life miserable for potential calling card defrauders. MCI omitted the customer's seven-digit code number from the card, mailing this number directly to the customer. "MCI tells its travel card users to keep their numbers to themselves and not to write them down anywhere — especially not on their cards," MCI spokesman Gary Tobin said.

The second step in protecting the security of the travel cards was to make the seven-digit number difficult to guess. "There's no correlation between the personal code and anything," Tobin said.

Travel card customers must always key their card numbers into the telephone. "The user must always key the number into the phone. Since MCI has no operators, users never have to verbalize their numbers to an operator," Tobin explained. This eliminates the risk of having the number overheard.

MCI has experienced far fewer problems with calling card fraud than its chief competitor, AT&T Communications, whose calling card base dwarfs that of MCI. Nevertheless, MCI suffered total uncollected revenue losses attributable to abuse of between $400,000 and $500,000, a figure that Tobin maintained has been consistent for the last three or four years that MCI has offered travel cards to its subscribers.

Although this sum seems small compared with MCI's $1.28-billion long-distance revenue for 1983, Tobin quickly added that efforts are constantly being made to reduce the portion of the losses attributed to calling card fraud.

"We have employed a full-time investigation team all along. We also randomly sample bills for unusual calling patterns by means of a computer run and history," Tobin explained. "If we see someone spending, say, $50 the first month, $70 the second and then $12,000 the third, we will flag the number."

According to Tobin, MCI prefers to avoid publicizing its arrests and convictions for calling card fraud. "Publicity that you caught someone will give somebody else the desire to prove that he can beat the system," he said.

— *Bob Wallace*

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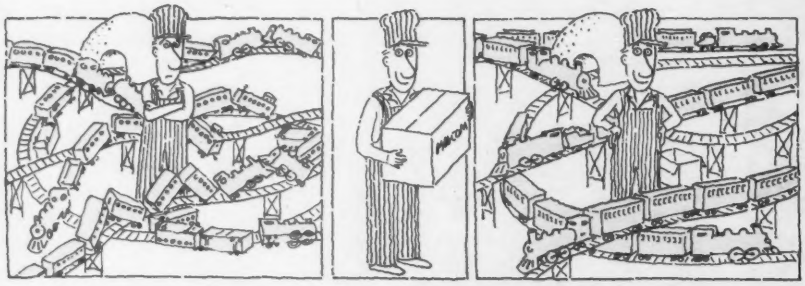

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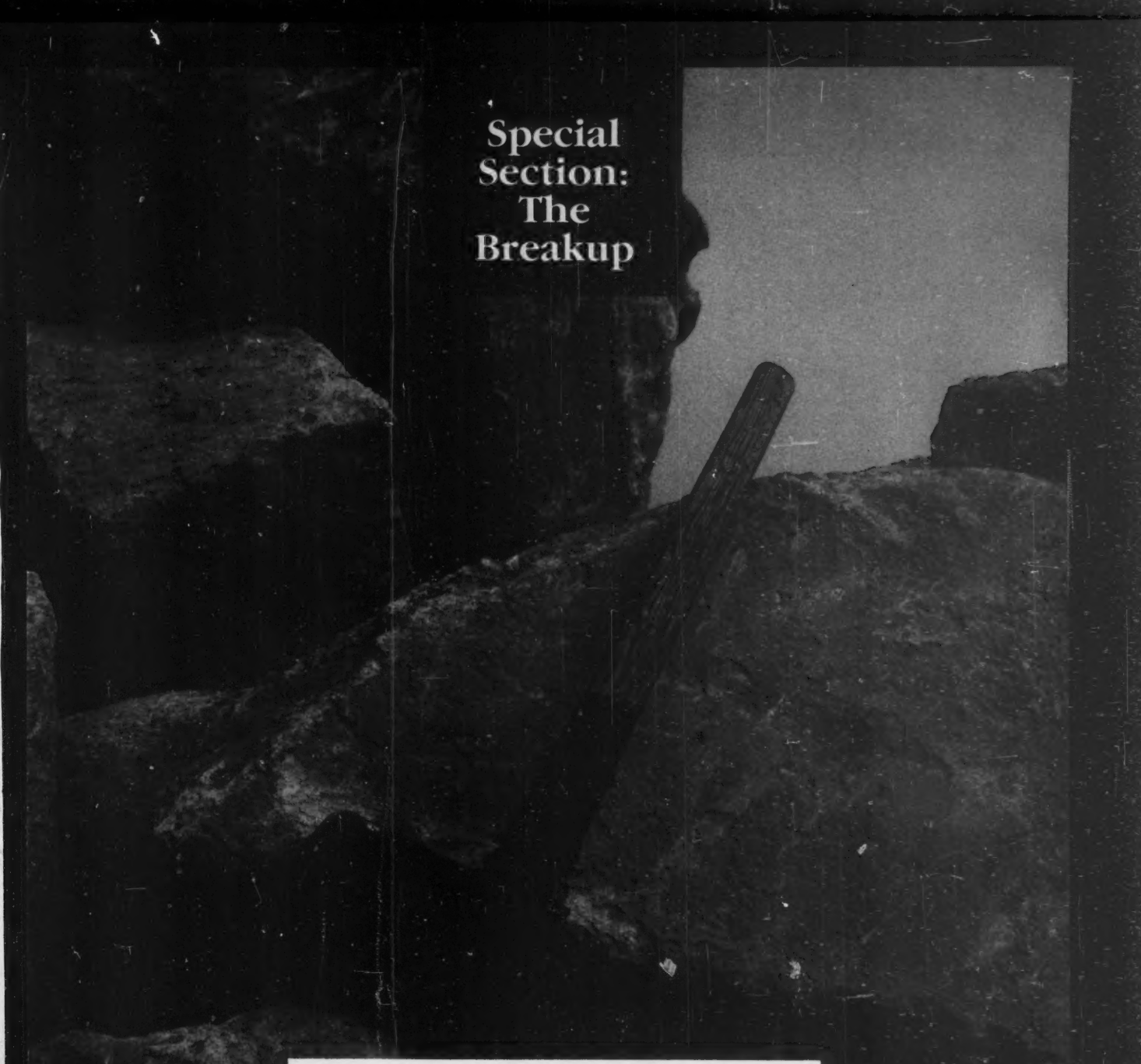


Special Section: The Breakup

SIX MONTHS AFTER

By Larry Crain

Although everyone is striving to see the positive effects of divestiture, there seem to be two major mistakes being made at this stage in the game. The first is that most of the involved parties have lost sight of the overall objectives to be achieved and the means by which they can be reached with the least conflict and pain. The second is that there has been so much focus on the concepts involved — which is understandable, given the size and complexity of the undertaking — that the implementation itself is falling apart. Many good ideas have died this way.

The primary objective must be a given. Competition lowers ▶

Crain is vice-president, corporate planning, Republic Telecom, Bloomington, Minn.

PHOTO: 1984 ED BRAVERMAN

costs, and it encourages the development and offering of new products and services to consumers. It promotes a healthy economic environment not only for the consumer, but for free enterprise. This objective is an important goal that can be achieved at least partly through divestiture.

In order to promote the concept of providing a competitive environment, it is necessary to evaluate the secondary objectives that will help in reaching the divestiture goal. First, especially careful attention must be given to ensuring fair competition in the telecommunications industry so that consumers will benefit. The boundary rules and regulations that were recently set up for this industry are necessary to control the excesses in competition, such as too much market power. These guidelines also set industry standards for consumer protection.

Next, it is important to look closely at minimizing the harm to the industry participants: consumers, local operating companies, AT&T and the other long-distance companies. This is an especially critical issue during this transition period. It may be several years before anyone fully recognizes and understands what is happening in this industry and how these experiences will affect the U.S. in the long run. Consequently, it is important that the transition period be as stable as possible.

THE CONSUMER, who is supposed to benefit most from a competitive marketplace, is still trying to figure out what is happening in this industry and what types of decisions will affect him in the future. Consumers can expect to be faced with many challenges in the new telecommunications game. Many consumers will not be able to understand the problems and issues involved and will be confused and uncertain. Much of the responsibility of self-protection has been left to the consumer himself, but things must be made as simple and clear to the consumer as possible.

Many governmental bodies have taken a great interest in battling for consumer protection. This interest has resulted in the postponement of the end-user access charge decision, except for multiline businesses. Some people feel that this postponement will protect consumers from economic harm, at least for the time being. However, isn't it possible that there has been an overreaction to the consumer access fee, that highly visible, politically expedient decisions have been made without addressing the overall economics involved?

If end-user access charges go into effect, customers will probably pay for a more cost-effective service. In the long run, higher local rates should be offset by a decrease in long-distance rates.

Access charges may actually benefit consumers since prices will move from artificial highs and lows to costs that more directly reflect the actual service used.

The important point is that many of the poor who previously could afford service under regulation will be forced to give up their phones simply because they cannot pay under a cost-based pricing system. This is a legitimate social concern that should be addressed.

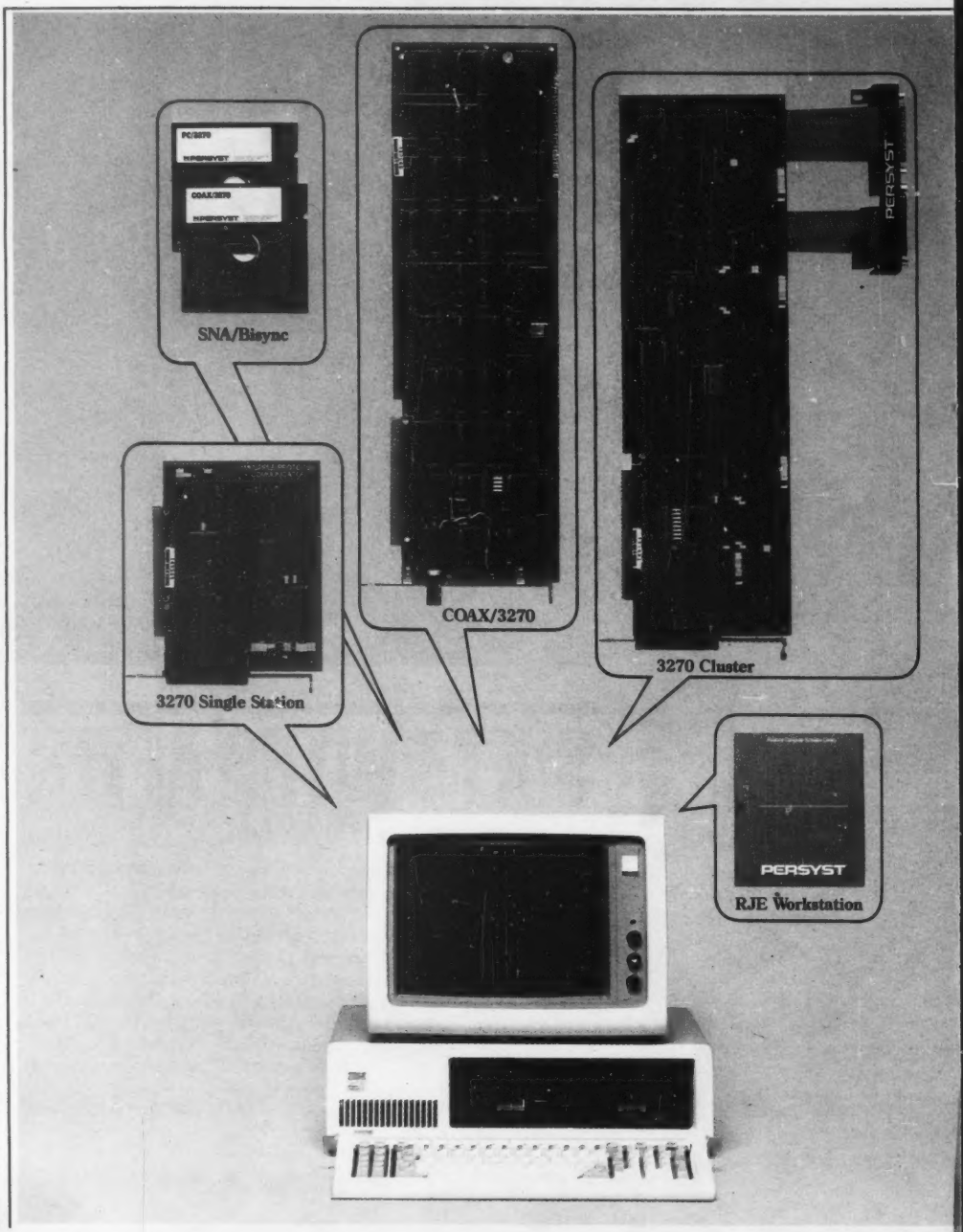
The local operating companies also deserve to operate in a fair environment. Fortunately, they are not being harmed during the transition period.

There was, and still is, a great concern for their financial stability. The concern is evident in access charges, the higher cost tariffs that are filed and approved, the various trade-offs for reentry into the toll markets and so on.

The operating companies, however, seem to be making out better than any other industry participant. They are getting carrier fees from AT&T, the long-distance companies and even some business customers in addition to getting local service rate increases. The first-quarter financial results show that the seven regional operating companies are not suffering: They are, in fact, making more money than any of the other industry participants.

The local operating companies can also enter new unregulated business markets. In addition, as creators of tariffs, local operating companies are able to formulate many of the rules under which they and the other players must operate. This power is awesome considering the number, impact and implementation pace of the new tariffs being filed. Neither regulatory bodies nor the other industry participants have the resources or expertise necessary to argue with many of the tariff details before they go into effect.

Aside from being forced to keep an intense pace to meet deadlines and schedules during the last few months, AT&T has not been severely harmed by the transitional divestiture environment. Six months after divestiture, it maintains, by far, the largest percentage of the nation's long-distance business. AT&T still has the reputation, the manpower and technical resources to hold a primary position in this industry.



More importantly, AT&T still owns and controls the majority of the network of lines and equipment in the U.S. It is not only the supplier to long-distance carriers, but it represents the competition as well. The difficulties of the transition have not harmed AT&T because of its powerful position; these difficulties have been passed on to its customers and competitors as line and service problems. This means AT&T's customers and competitors have suffered from AT&T's administrative problems more than AT&T itself has.

As a competitor in this new market arena, AT&T would like to have the advantage of total deregulation in the marketplace. However, that type of deregulation so soon after divestiture would be detrimental to industry competition. If regulatory reins are loosened too quickly for AT&T, the entire purpose of divestiture would be defeated before consumers could see its advantages.

While AT&T still hovers over the telecommunications industry, the long-distance companies are fighting to keep their heads above water. Of all the telecommunications game players, the long-distance companies have, perhaps, suffered the most harm during this transition period.

Long-distance carriers may be paying the highest price for divestiture when they are least able to afford the burden. Along with consumers, the long-distance companies do not have the resources or the market power to deal with the power of the local operating companies and AT&T as both suppliers and competitors. Since divestiture, getting lines and service connections from both the operating companies and AT&T has become a nightmare. There are many documented cases of circuit delays and other problems that severely harm the long-distance companies' images and customer relationships while dramatically increasing their expenses and reducing their revenue and profit.

Long-distance companies are forced to try to stay on top of the constantly changing legislative and regulatory changes. With these increasing pressures, it is difficult, if not impossible, for a long-distance company to run business, while facing a stream of dramatic regulatory torpedoes.

It is appropriate to mention the final objective of deregulation — maintaining universal telephone service. This refers to near universal phone service. The U.S. has never had, and probably never will have, a universal phone network. However, this concern is legitimate, especially during the transition phase when consumers may be forced to deal with some local service rate hikes.

There are various ways for governmental bodies to provide near universal service for people who cannot afford to pay for it, without disrupting the competitive marketplace. Phone service should be widely available without the creation of artificial costs and pricing in telecommunications.

OVERALL, THE CONcepts behind the creation of a competitive telecommunications marketplace will help provide a healthy economic environment, which will benefit the consumer. However, the actual mechanisms of implementation, although good in principle, are not working. The strategies of implementation are not well-thought-out and lack proper evaluation. If these concerns are not addressed in the near future, divestiture will continue to increase problems, rather than alleviate trouble in the telecommunications industry.

There are three mechanisms that have been used in moving toward a competitive telecommunications marketplace: divestiture, equal access and access charges.

Although these tools provide positive concepts, they are creating an adverse environment for competition because of the way they are implemented.

When divestiture took place on Jan. 1, 1984, a step was taken that no rational businessman would take without preparation. New administrative systems for operating within and between companies were not in place. Neither AT&T nor the operating companies were prepared for implementation. The system's original bugs got progressively worse instead of better as the transition continued.

The results show that we still do not have tested, working systems to handle circuit orders and service problems. Ironically, this administrative disorganization by two of the primary players has had devastating effects — not on the primary players, but on consumers and competitors.

Many lines and connections ordered by long-distance carriers from AT&T Communications have not been delivered. Other carriers have also experienced problems regarding lines disconnected without orders, incorrect installation and bills for nonexistent or unrequested lines. Instead of quality improvements for carriers after the initial implementation of divestiture, things went even

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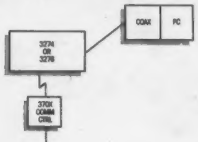

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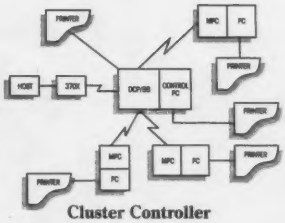

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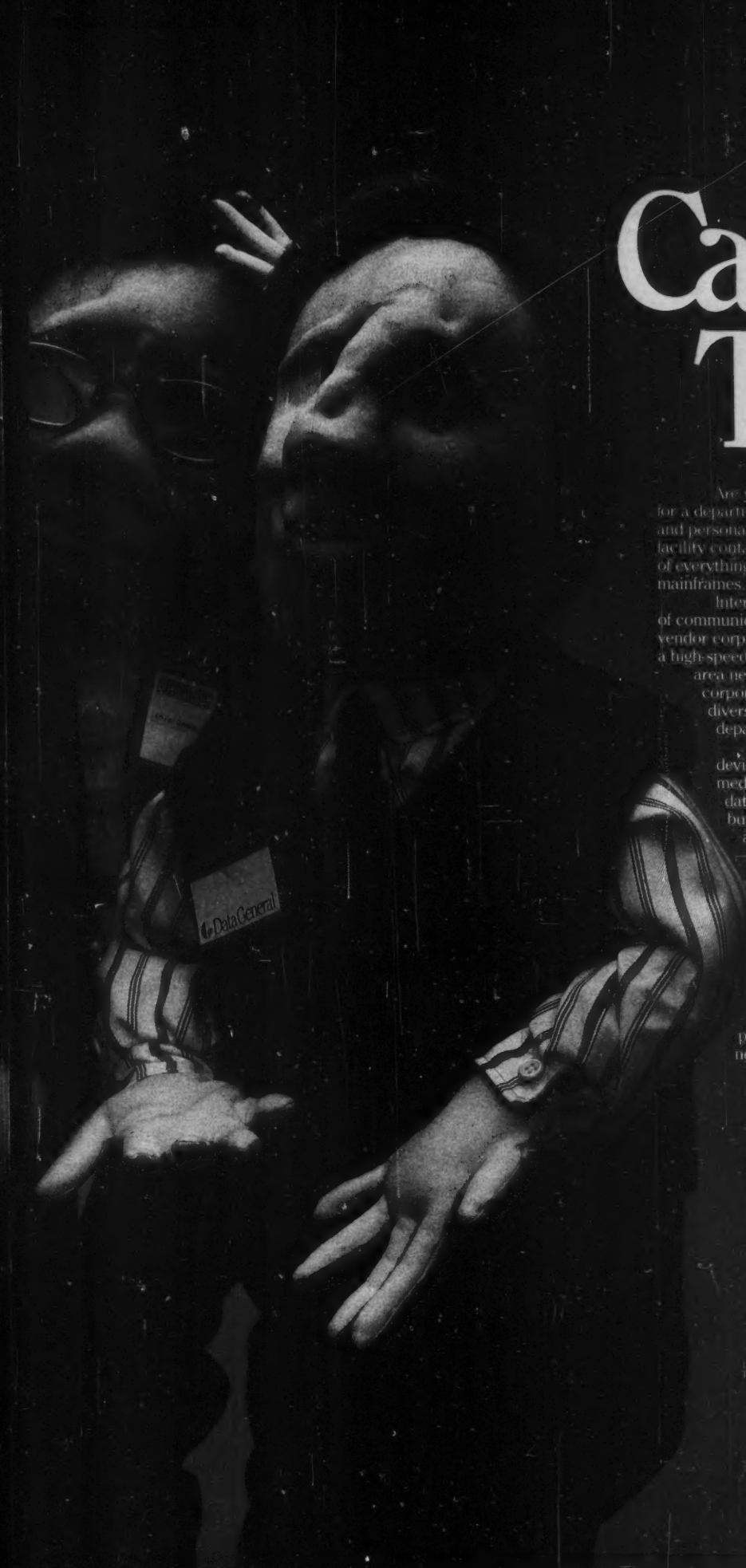

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further downhill. The backlog of orders for AT&T lines went from a few thousand to more than 28,000.

These delays and problems are certainly not beneficial to the carriers' images or business operations. They only increase expenses for the competing long-distance companies and decrease profit and revenue growth. With a decrease in customer base for these carriers, competition will not thrive in this industry. In fact, some carriers will probably be driven out of business.

In order to fend off some of these difficulties, many long-distance companies have been forced to hire extra staff just to track problems.

The equal access concept is another example of faulty implementation. Although the idea of promoting equal competition is good, when it is combined with divestiture problems, there is no way equal service can be provided to the customer. Another major problem is that switch vendors generally have not yet made their switches compatible with equal access. Thus, most carriers cannot participate in equal access at the pace set forth in the schedule. With the current emphasis on meeting an equal access schedule — which includes higher costs — without creating the ability to offer equal service, the long-distance companies are losing out at an early and critical stage.

In addition, the equal access implementation process is a quagmire. Each local operating company has great flexibility in implementing equal access. This is resulting in different rules among various companies, constantly changing rules from individual companies, the release of incomplete information, delayed release of information or information from the long-distance companies and arrangements that are designed to benefit the operating company since the long-distance carrier has little choice but to abide by them.

Some of the seemingly inappropriate rules being used by some operating companies are:

- Intra-Local Access and Transport Area traffic is blocked and taken by the operating company, even from companies that can legally carry such traffic.
- The long-distance companies' pricing structure and levels are restricted.
- If carriers decide to discontinue equal access participation within two years, they still must pay the operating companies.

THE BOTTOM LINE IS that equal access cannot and will not be achieved in the near future. In addition, the implementation process currently underway is creating more problems than it is solving. The transition process needs better planning.

Finally, the most controversial factor is the access charge issue. The premise of access charges is that the local operating companies must get revenue to help pay for service provided to their customers — even though part of the revenue needs are created by their own inefficiencies and overstated expenses. In the future, customers will be expected to pay for the service they receive. Access charges are a way to move from a monopolistic environment to a competitive one. It has been decided that the planned $2 monthly consumer access charge will be delayed, which is contrary to the overall concept of a true cost-based, competitive environment. The amount of money to be transferred to the local companies and the source of that money will remain contentious issues that are not easily resolved. Solutions should not be based on politics or vested interests.

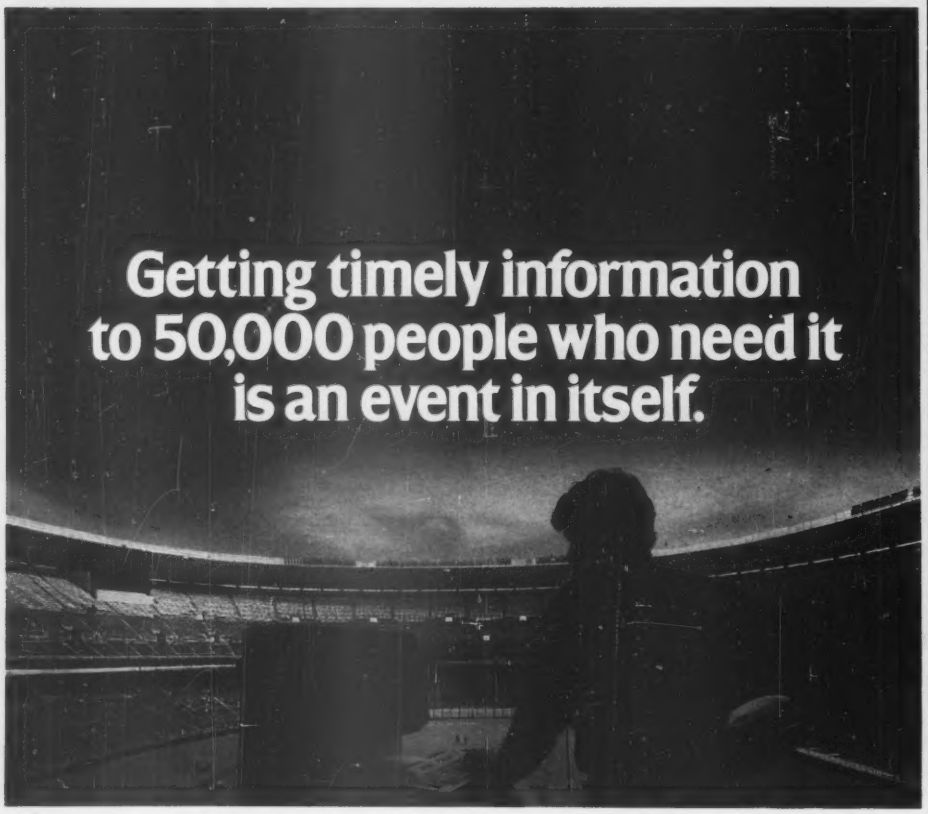
So how do we rectify this situation? First, it is necessary to recognize some realities. The governmental bodies overseeing this transition do not have the resources necessary to plan, manage and oversee the implementation in the time frames set forth. Consumers and long-distance companies do not have such resources. The time frames must be extended so the implementation can be planned and managed well.

Second, it is necessary to keep the overall objectives in mind and to weigh each move against those objectives as well as addressing each narrow issue. Third, it is necessary to encourage a cooperative approach between the federal and state regulatory bodies.

Finally, it is necessary to focus more on what is good, right and fair and less on vested interests.

As we look toward a solution for these implementation problems, it is necessary to remember that the concepts behind the divestiture transition are good. However, before the implementation occurs, full discussion and analysis should occur to ensure that it will achieve the ultimate objectives of divestiture.

No, things are not running smoothly for everyone six months after divestiture. However, there is hope, if we educate ourselves. The issues of concern in this industry are simply too important to ignore. ■



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Special Section: The Breakup

AT&T COMMUNICATIONS

By Katherine Hafner

The list of laments is familiar by now: The breakup of the Bell System has thrown the communications industry into chaos. In this case, big was not necessarily bad. Knee-jerk antimonopolism ruined one of the most efficient operations the world has known.

Whatever your opinion of the AT&T divestiture, one matter is beyond dispute: Of all the unwitting victims, AT&T Communications has the most woeful tale to tell. Lagging hopelessly behind in its service orders, the former AT&T Long Lines has inspired a chorus of criticism from customers, the press and industry analysts. The informal way in which Long Lines and the Bell operating companies filled service orders in the past has dissolved, ▶

Hafner is senior writer for Computerworld On Communications.

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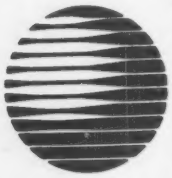
and it has been replaced by enough bureaucracy to encumber the process almost beyond reason. The worst problem lies with service on private long-distance and Wats lines. The backlog of orders for private lines numbered 28,200 at the end of April, according to a spokesman for AT&T. The firm recently told regulators that this backlog had nearly doubled since March and the problem would probably not be fixed until the end of the year. In its statement to the Federal Communications Commission (FCC), AT&T said that only about 20% of the private-line orders are being filled on schedule.



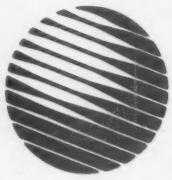
In the opinion of some harried AT&T Communications employees attempting to adjust to the more formalized way of operating, trying to anticipate the effect that divestiture would have on service provision was a bit like trying to simulate a war. Until the bomb was actually dropped, it was difficult to assess the consequences.

To address the problem, AT&T has organized a nationwide task force composed of AT&T employees to process orders. And AT&T has spent "millions of dollars" to fix the problem, according to a company spokesman. Still, customers claim to perceive little if any improvement in the situation and are still waiting months for an order that used to take a few days to fill.

"Is divestiture working? No. All the cylinders in the AT&T engine are not firing in the correct sequence," Jack McGrath, director of telecommunications networks for Consolidated Rail Corp., said. "We have [service] orders that were submitted late last year that still haven't been filled. Somehow, in the waning days of the old AT&T, paperwork went into a black hole and never emerged."

McGrath estimated that his company is losing "thousands of dollars" for each month that service requests go unfilled. "I feel helpless, too. I really don't have an alternative [to AT&T] at this point," McGrath said. "The [MCI Communications Corp.'s] of the world are good if you want a competitive alternative in a major market. But our network goes into some very rural places."

As unrelenting an issue as the service problem is, a more fundamental issue is that of a regulated company in an increasingly unregulated market. Harry Edelson, an analyst with First Boston Corp., said, "It is an amorphous industry now. Phone company stock is no longer for widows and orphans."



In light of AT&T's poor financial showing recently, some jaundiced Wall Street analysts claim they would no sooner invest in AT&T stock than dance on a bed of hot coals. Others claim that the bad performance will be short-lived, and, still a behemoth at $55 billion in annual revenues, AT&T is a strong bet for investors.

In AT&T's favor, of course, is its cash cow, the ubiquitous long-distance service. With 111,000 employees and a construction budget of $1.1 billion, AT&T serves more than 200 countries and is working to refine its equipment so that by 1990 all switching facilities will be digital.

The actual percentage of the overall telecommunications market that AT&T Communications commands depends on one's definition of the market.

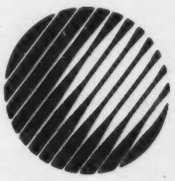
"If you want to define the relevant market in terms of total inter-[Local Access and Transport Areas] telecommunications, including private microwave, then AT&T Communications' share is under 50%," Richard Snowden, AT&T Communications' director of services planning, said. "If you're talking about just the message toll business, it's more like 90%."

According to John Malone, president of Eastern Management Group, a consulting and market research company in Parsippany, N.J., AT&T's market share is 94%. Malone claimed AT&T must halt the erosion of its market share because each 1% lost represents $350 million in lost revenue.

In its favor, Malone said, are the company's modern and efficient plant facilities, combined with "unparalleled" geographic reach and flexible service offerings.

AT&T Communications' Snowden agreed: "Customers don't want a static communications network. They want the flexibility to use telecommunications resources for voice, data and image without having to rearrange those networks as their business demands require."

Snowden pointed out the flexibility in AT&T Communications' 800 service. "We have introduced levels of flexibility into the 800 service we did not have in the past," Snowden said. "Now, we have such options as alternate destinations and data bases the customers can change themselves," Snowden continued.



AT&T Communications is fully embracing such technologies as fiber optics. According to Snowden, all of the company's guided systems in the future will be fiber optics-based, and eventually fiber-optic cable will replace coaxial cable.

"There is no question that fiber is the technology of the '80s," Snowden said, "and probably into the '90s as well."

AT&T Communications also subscribes to the widespread belief that the demand for voice communications far outweighs that for data communications. As much as the requirement for data communications continues to grow, it remains about 10% of the market. "Voice definitely predominates," Snowden said. "Data is an important piece of it, but a relatively small part of the total telecommunications environment. Even if you look into the 1990s, any telecommunications solution that doesn't accommodate voice won't be a good solution."

If anything is anathema to AT&T Communications, it is regulation. As the only common carrier whose tariffs and service offerings are so closely scrutinized, AT&T Communications views itself as operating under a continual disadvantage as telecommunications evolves into more of a commodity market.

Eastern Management Group's Malone noted: "As equal access arrives and advertising reaches unprecedented levels, regulation is not just not beneficial, but it becomes a major weakness for AT&T Communications."

In May, the FCC ruled that AT&T must reduce its long-distance rates 6.1%, which fell short of the 10.5% reduction AT&T had been hoping for, but proved nonetheless to be a step toward real competition with the other common carriers.

"We are pleased we have been able to reduce rates, though not as much as we would like to," Jim Pagos, division manager in marketing at AT&T Communications, said. "There is still that significant reduction the other common carriers get [for long-distance circuits], and it gives them an artificial cost advantage."

AT&T Communications, fully regulated because it is a dominant carrier, considers such regulation "costly and unnecessary in a competitive environment." The company estimates that the direct cost to AT&T of regulation is $200 million a year. On April 2, AT&T asked the FCC to "formulate rules only if they are needed to respond to specific regulatory needs" and do away with those that "impede the flow of technological benefits to the consumer."

AT&T has also requested that the FCC overturn its 1980 Second Computer Inquiry ruling that provides for the separation of AT&T's competitive and regulated business. In its argument, AT&T maintained that the Second Computer Inquiry was rendered obsolete by the divestiture, when AT&T was separated from the Bell operating companies.

The FCC has already publicly acknowledged that the regulation of AT&T Communications is indeed heavy. "The FCC has been talking for more than a year about the regulation in the long-distance market and agrees that things are too heavily regulated," Gail Purpura, a spokeswoman for AT&T Communications, said. "Yet, it still took 117 days for the FCC to allow us to test one optional calling plan.

"Regulation is pervasive," Purpura continued. "We say lift the regulation and allow us to provide services to customers the same way other companies do. If there is concern that if regulation is lifted there will be people without long-distance service, then let the FCC address that concern. We are not asking for total deregulation. We are talking about lifting the current pervasive regulation." ■

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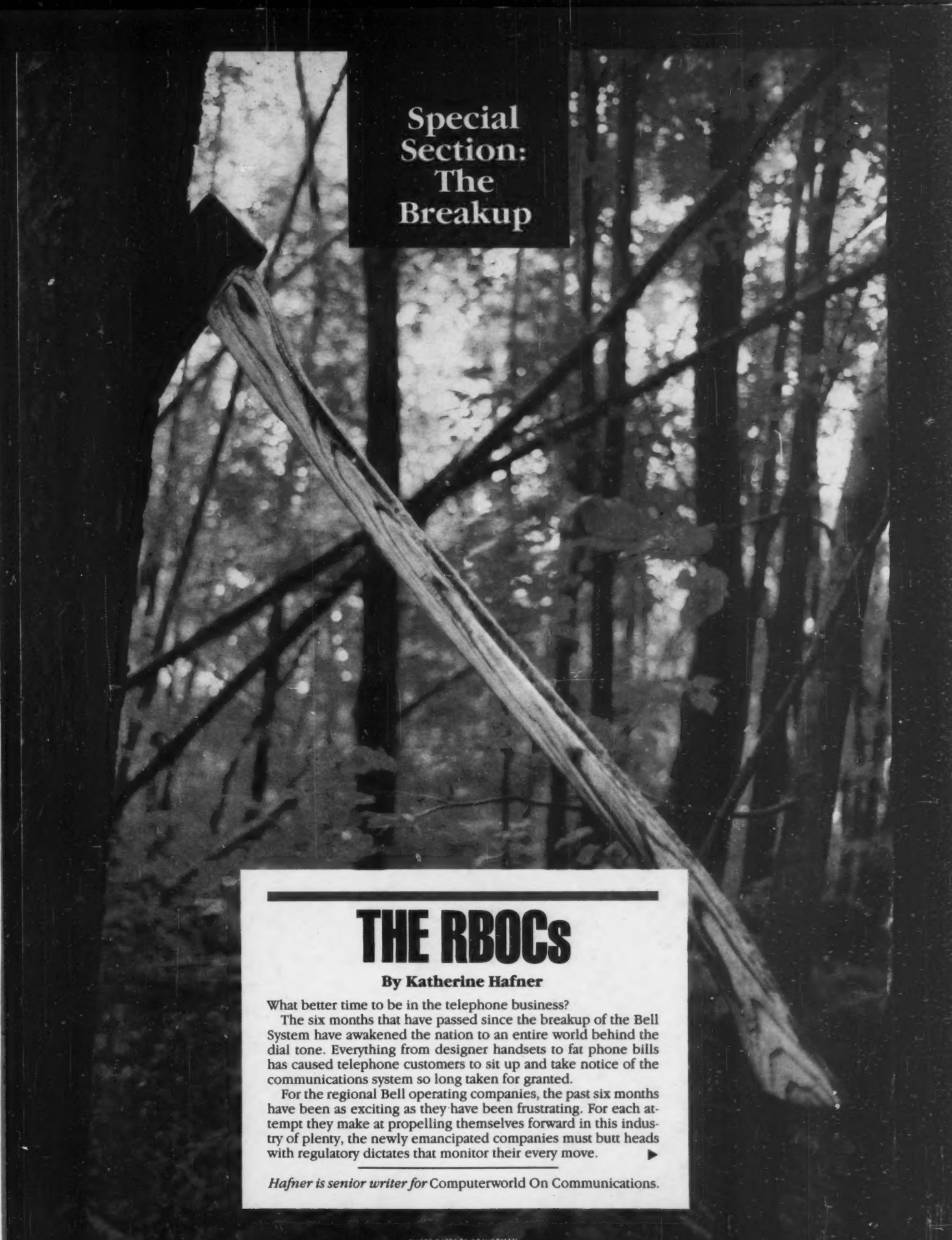

Special Section: The Breakup

THE RBOCs

By Katherine Hafner

What better time to be in the telephone business?

The six months that have passed since the breakup of the Bell System have awakened the nation to an entire world behind the dial tone. Everything from designer handsets to fat phone bills has caused telephone customers to sit up and take notice of the communications system so long taken for granted.

For the regional Bell operating companies, the past six months have been as exciting as they have been frustrating. For each attempt they make at propelling themselves forward in this industry of plenty, the newly emancipated companies must butt heads with regulatory dictates that monitor their every move. ▶

Hafner is senior writer for Computerworld On Communications.

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Regional Operating Companies

The narrow margin in total assets of the regional companies, ranging from $17 billion to $22 billion, is not a coincidence. When the nation was divided into separate regions, it was with an eye toward balance and uniformity. For their equal financial footing, however, each of the regional operating companies has in mind its own formula for success.

Ameritech, the holding company for Illinois, Indiana, Michigan and Ohio Bells and Wisconsin Telephone, was the first to be operational in the cellular mobile business. Since its start in October, Ameritech Mobile Communications has acquired 7,500 customers for its mobile radio service. U.S. West has moved into the telecommunications consulting business, and Pacific Telesis Group is hoping to expand into overseas markets. In addition, every regional holding company but Ameritech wants to offer end-to-end protocol conversion within proposed local packet-switched networks rather than through separate enhanced services subsidiaries.

Despite the fact that each of the regional companies' total assets amount to billions of dollars, in many ways, the seven companies are approaching the telecommunications market like entrepreneurs.

"I am as aware as anyone that the entrepreneur is usually an innovative business person who starts out small and undertakes a risky venture," William L. Weiss, chairman of Ameritech, said at a recent seminar. "But I'm convinced that the entrepreneurial spirit can characterize a company such as ours."

As far as innovation on the unregulated side of the business is concerned, some regional companies are taking noticeably more risks than others. "U.S. West is way out front in terms of the most imaginative ventures," Dan Rosenbaum, a senior analyst at the Yankee Group in Boston, said. Rosenbaum said he is most impressed with U.S. West's Interline Communications Services, Inc. subsidiary, which was formed to provide communications consulting.

The company can operate anywhere in the country and plans to open 30 offices nationwide by the end of the year. "I think Interline is a spectacular idea," he said. "It gives users a single point of contact. [U.S. West] is leveraging one of its great intangible assets: its expertise, which is not going to show up on any kind of balance sheet.

"People say U.S. West is the holding company most likely to stub its toe," Rosenbaum continued. "But it is picking up the challenge that divestiture is presenting it." Rosenbaum attributes part of the reason for U.S. West's boldness to its wide geographic reach and sparse population density. Stretching from the Great Lakes to the Pacific Ocean to New Mexico, U.S. West serves an area with a density of approximately 17 people per square mile outside of central cities. This contrasts sharply with Ameritech, whose density is nearly 140 people per square mile.

According to John Malone, who is president of the Eastern Management Group, a market research

Despite the fact that each of the regional companies' total assets amount to billions of dollars, in many ways, the seven companies are approaching the telecommunications market like entrepreneurs.

and consulting firm in Parsippany, N.J., the regional operating companies possess a number of strengths that have been working in their favor since the divestiture. These include the companies' high revenue stream and the "ubiquitous presence" of their local networks. "The local loop is actually a mixed blessing," Malone noted. While it does not provide the revenue of a long-distance network, "the local loop gives the regional company a tie to every customer in the region."

Another clear strength for the operating companies in the wake of divestiture, Malone said, is what he calls "customer goodwill" toward the companies. "It varies from region to region," Malone said. "It is strongest at South Central Bell, and it is clearly a benefit for all of them." Each of the regional holding companies has taken a different tack in structuring its business. Ameritech, for instance, in the Midwest, is little more than a figurehead for its five decentralized telephone companies, their various subsidiaries and five unregulated subsidiaries.

On the other hand, Nynex, the holding company for New York and New England Telephones, has taken a much more centralized approach and has spent the past several months adopting and promoting a corporate culture that centers around its quirky name.

"It has been an interesting growth period, to say the least," Pete Goodale, a Nynex spokesman, said of the past six months. "We are trying to pull an organization together as a cohesive group and have all our people think of Nynex as IBM employees think of themselves."

At press time, Nynex had a waiver request in with the Federal Communications Commission (FCC) that would allow the company to use one sales force to sell regulated network services and unregulated terminal equipment. Under the terms of Computer Inquiry II, the two businesses must remain separate.

"We think it would be in everyone's best interest for Nynex to have a combined sales force," Goodale said. "Customers want an integrated sales force. It is a hassle to have to go to different companies for different things."

IF ANY OF THE companies is challenged by the effects of divestiture, it is Nynex, whose service area includes some of the nation's ripest places for bypass. "Highly concentrated areas, especially those with a large business community, are prime areas for bypass," Goodale conceded. "We feel we could be competitive if we did not have to subsidize other services. We are doing well, but we are concerned that if the subsidies continue too much longer, there will be a big problem."

To fight such threats as bypass, local companies appear to have some clear plans. "We are dealing with it by offering high-speed data over our existing network," Ed Glotzbach, division staff manager for business sales at Southwestern Bell Corp., said. "We are trying to educate customers on our high-speed data-switching offerings. A perception has arisen since divestiture that the operating company is just for plain old telephone service. That's a perception. It's not a reality."

Indeed, the opportunities in the unregulated market may be plentiful, but overcoming the constraints posed by the 1982 Modified Final Judgment and the FCC's Computer Inquiry II is challenge enough for the seven companies.

"They have all sorts of rules they have to follow, most of which they are not even aware of yet," Yankee Group's Rosenbaum said. "Their entire corporate future is sitting in the palm of Judge Greene's hand."

Several of the local operating companies have found themselves sitting in the path of fire between

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AT&T Communications and its many irate customers who are awaiting service for Wats and private lines.

According to one Bell operating company spokesman, when AT&T Communications goes to a local operating company for a long-distance connection, in 97% of the cases, there is no wait. This means it is not directly accountable to the legions of angry people waiting for service. Still, it feels the pressure.

"From our perspective, we are doing the job all right, but from the perspective of the AT&T Communications customer, we may not be getting the job done. Occasionally, we do catch the flack, but it is misdirected," Hildreth said.

"Before divestiture, we could work hand in hand with providing the whole service," Ken Hildreth, a spokesman for Illinois Bell, said. "Now that we are two separate companies, it has made things a lot more complicated. From our perspective, we are doing the job all right, but from the perspective of the AT&T Communications customer, we may not be getting the job done. Occasionally, we do catch the flack, but it is misdirected."

Some of the problems that have cropped up since Jan. 1, 1984, include "pinpointing exactly where [AT&T's] circuits end and ours begin" and the simple processing of orders, according to Hildreth.

The AT&T divestiture has accented some lingering issues for the operating companies. "Divestiture points up the whole problem of subsidies and cross-subsidies that have been such an integral part of the telephone company," Patricia Montgomery, a spokeswoman for Illinois Bell, pointed out.

"For one thing, it has made it clear that there has got to be a change from subsidization to cost-based pricing. That is an important element in making sure our local rates become competitive in the new environment where we will be facing local competition, whether it is bypass or anything else."

According to the Eastern Management Group's Malone, one major weakness for the regional companies is what he terms "mature markets."

"They have an awful lot of local loops, but they are not very exciting because it is a market that grows so slowly," Malone said.

In Malone's view, among the other challenges facing the regional phone companies are "identity problems" attendant with selling customer premises equipment in other regions. And, of course, the regional companies are hindered by the restrictions imposed by the 1982 Modified Final Judgment. "One by one," he said, "the operating companies are going to petition the government to allow them to move traffic inter-[Local Access and Transport Area]. They want to maintain their de facto lead in local exchange, but they also want the opportunity to pick up inter-Lata revenue."

"Competition is here, and it is pervasive," Ameritech's Weiss said. "The monopolistic environment has been eliminated, but the traditional style of regulation is still with us, and I suggest it is obsolete.

"We are no longer in the telephone business," he said. "We are in the business to help people send and receive information in any form. We want our business to become fully competitive, not just in theory, but in fact." ■

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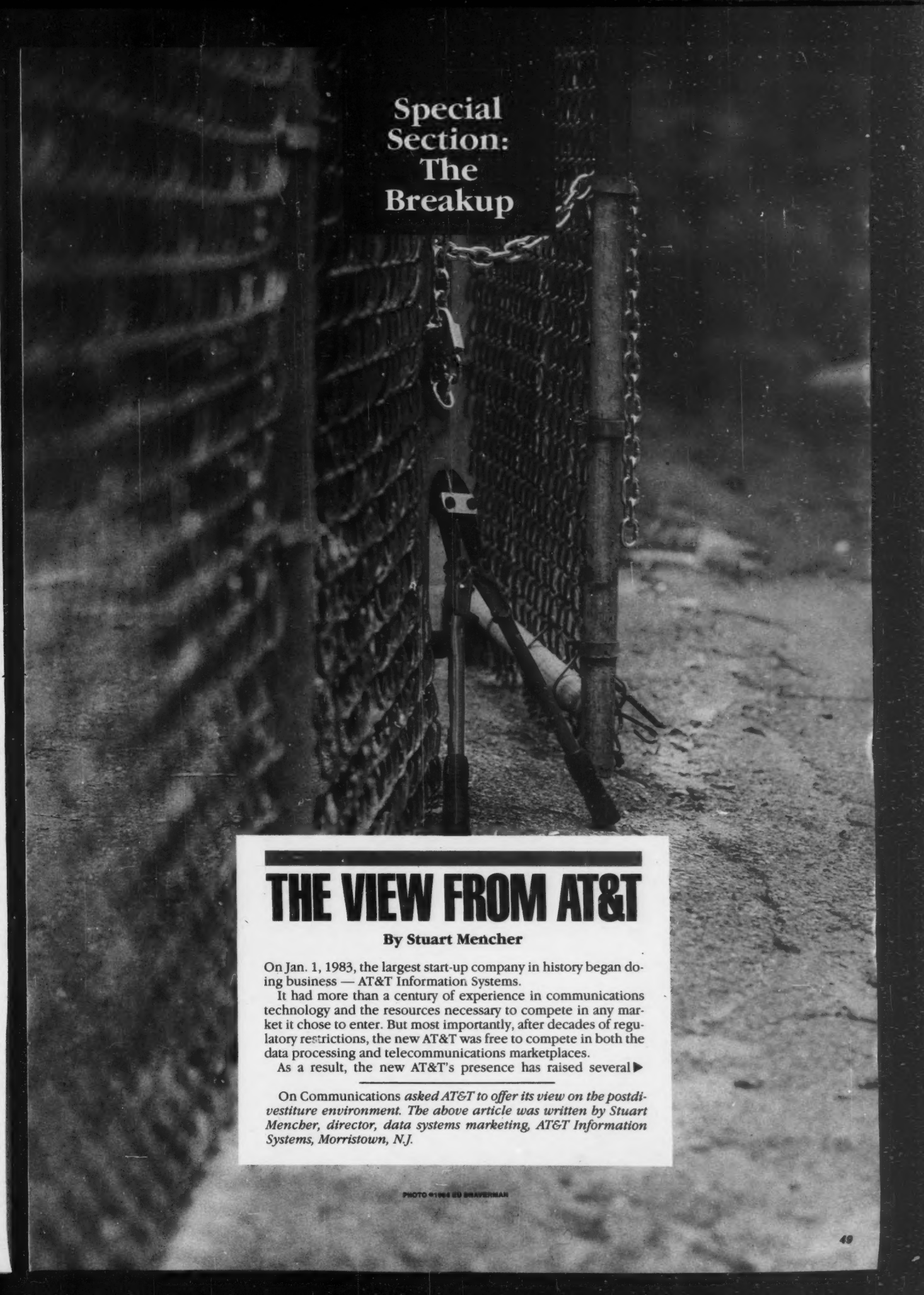


Special Section: The Breakup

THE VIEW FROM AT&T

By Stuart Mencher

On Jan. 1, 1983, the largest start-up company in history began doing business — AT&T Information Systems.

It had more than a century of experience in communications technology and the resources necessary to compete in any market it chose to enter. But most importantly, after decades of regulatory restrictions, the new AT&T was free to compete in both the data processing and telecommunications marketplaces.

As a result, the new AT&T's presence has raised several ▶

On Communications *asked AT&T to offer its view on the postdivestiture environment. The above article was written by Stuart Mencher, director, data systems marketing, AT&T Information Systems, Morristown, N.J.*

PHOTO ©1984 ED BRAVERMAN

questions among industry observers. What is the so-called "new" AT&T? What impact will it have on the market? What can customers expect from it?

Here is just a sampling:

■ First, we are now able to be more responsive to customer needs. For example, we now have a nationwide pricing policy that enables us to introduce products across the country at the same price and at the same time. We have also made it easier for customers to do business with us. We have introduced a variety of flexible purchase and lease options for our customers and also offered them volume discounts.

We have established an Information Systems Architecture that provides the framework that interconnects all of AT&T Information Systems products into a cohesive whole and allows other vendor product lines to connect to our business automation systems.

■ Second, we are developing and introducing to the marketplace new technological innovations that meet the needs of U.S. businesses at an extremely rapid pace.

■ Third, we have established an Information Systems Architecture that provides the framework that interconnects all of AT&T Information Systems products into a cohesive whole and allows other vendor product lines to connect to our business automation systems. AT&T Information Systems is not only reaching out to others, it is also inviting them in.

■ Fourth, AT&T Information Systems has in place one of the nation's largest service and support networks. Our tradition of quality and service will continue to be an industry standard.

■ Fifth, we are free to enter and compete in new marketplaces, building on our expertise in telecommunications and data processing.

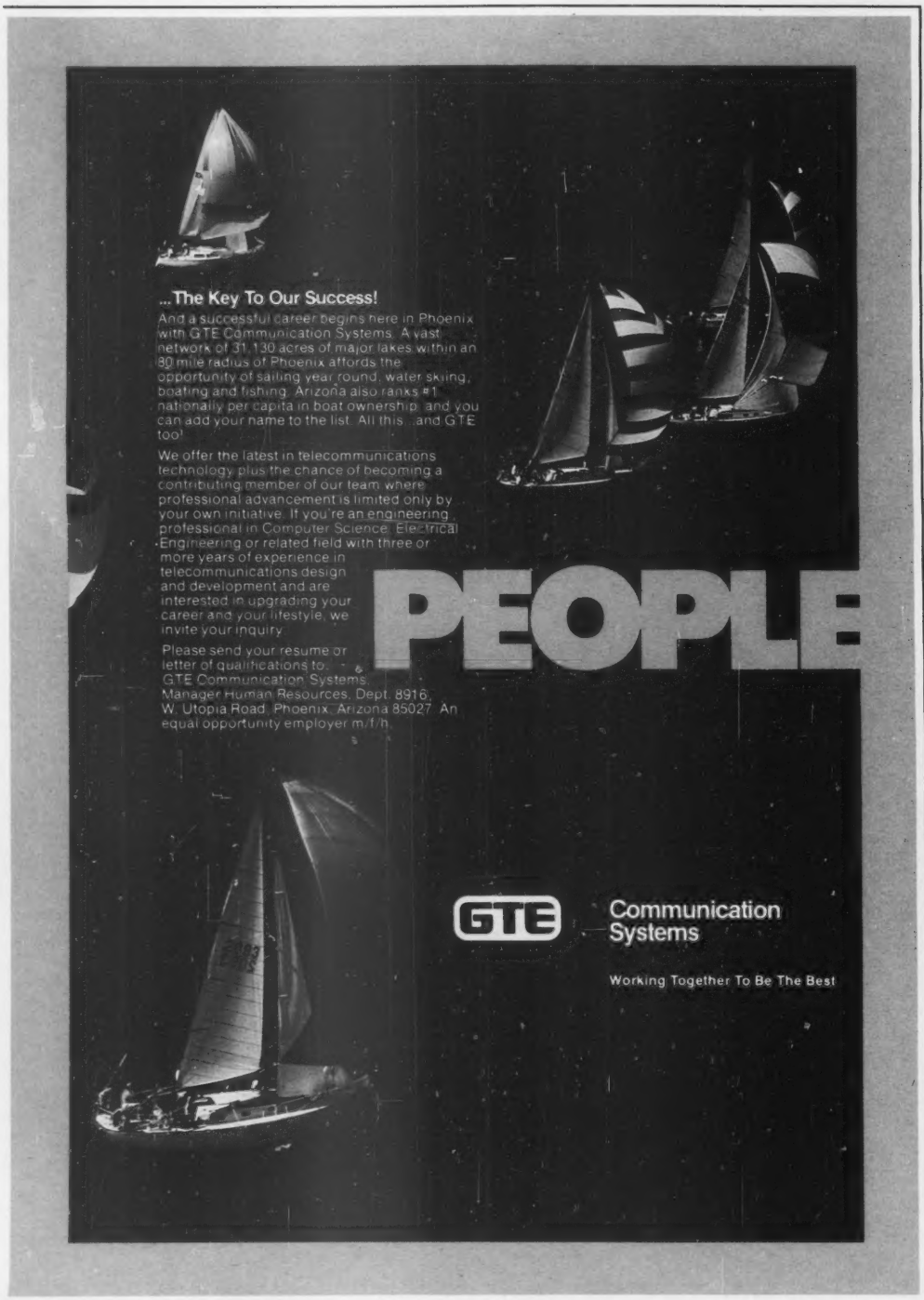
AT&T entered the deregulated competitive communications marketplace in January 1983. Yet, we introduced 35 new products last year — more systems in less time than ever before. That is the key difference between the old and new AT&T — our ability to respond to the needs of our customers. Here are a few examples.

JUST 18 DAYS after we opened for business, we unveiled System 85 for our larger customers. System 85 is an integrated voice and data communications controller that provides customers with sophisticated office, network and building management functions. Six months later, we enhanced System 85, broadening its size and functionality.

In October 1983, we introduced the Merlin communications system for small business customers. Merlin provides many of the functions of larger switching systems in a product that is easy to use, easy to install and easy to buy.

For mid-size customers, we introduced System 75 in April 1984. System 75 is a state-of-the-art system that offers a wide array of integrated communications and system management features.

Our entry into the data processing market in March 1984 was not a surprise to AT&T observers.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We have been in the computer business internally for a long time. AT&T already manages the world's largest distributed processing computer system — the U.S. telephone network.

For more than two decades, AT&T has been applying its computer technology to its switching systems. This same technology is now being put to work in various office systems. In fact, our AT&T Information Systems sales force has been selling our 16-bit Applications Processor as a speciality computer for some time.

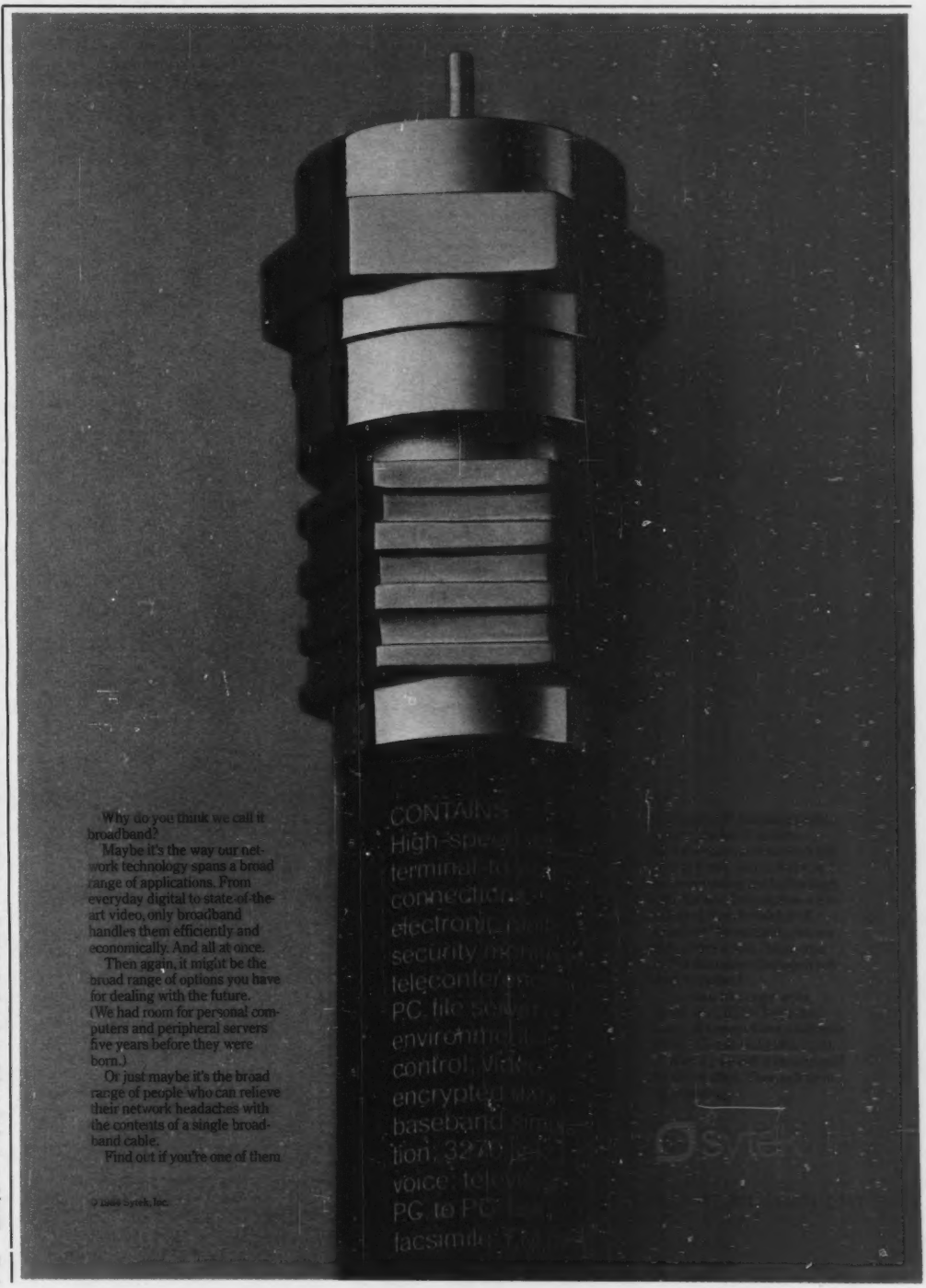
To get our Personal Computer to our customers, we have further expanded and improved our sales and distribution system. Our sales force will continue to sell directly to large customers and through parallel channels such as the OEM and value-added reseller markets.

IN MARCH 1984, AT&T announced the 3B line of computers. They are Unix-based, multiuser, multitasking computers. At that announcement, we made our computer line available to OEMs and value-added resellers and to large end users with internal data processing staffs. Our purpose was to stimulate development of applications software and to call on the creativity of individuals and independent organizations in providing useful tools for today's demanding business needs.

We also announced a Personal Computer Interface that connects the 3B computers running Unix System V to personal computers running MS-DOS. This provides full 32-bit Unix System V access to personal computer owners, provides an efficient means of networking personal computers and permits the sharing of computer peripherals, such as hard disks and printers, by all personal computers — rather than having to equip each personal computer with these expensive options. We also announced 3B Net to interconnect the 3B line. When we announced our general-purpose 3B computer family in March, we promised that AT&T would have more to talk about. This commitment was met in late June when we announced the AT&T Personal Computer, a local-area Information Systems Network and software for our Unix- and MS-DOS-based computer family. We also expanded our marketing program by offering our 3B 2 and 3B 5 computers to end users and introduced a line of protocol converters and coaxial eliminators.

But first, consider the AT&T Personal Computer. It runs considerably faster than its leading competitor, yet it runs the same MS-DOS and concurrent CP/M-86 operating systems. This gives users broad access to industry standard applications, from accounting and spreadsheets to word processing and graphics. And the Personal Computer has attractive price and performance.

To get our Personal Computer to our customers, we have further expanded and improved our sales and distribution system. Our sales force will continue to sell directly to large customers and through parallel channels such as the OEM and value-added reseller markets.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Maybe it's the way our network technology spans a broad range of applications. From everyday digital to state-of-the-art video, only broadband handles them efficiently and economically. And all at once.
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In addition, we will be selling the AT&T Personal Computer through selected computer specialty retail chains.

Our Information Systems Network uses a mix of fiber optics and twisted pair, which is consistent with our premises distribution approach, to tie together the AT&T Information Systems family of workstations, terminals, personal computers and 3B processors. Information Systems Network also complements switching systems such as System 75 and System 85 and our existing Dimension family of 2000, 600 and 400 private branch exchanges. Information Systems Network combines the best attributes of the star-distributed bus and token-passing ring configurations. It uses packet switching and perfect scheduling, for collision-free access, to tie machines together. This results in optimal use of available bandwidth and minimal potential for packet-switching delays.

This precedent-setting local-area network is further proof of our intent to give customers the data facilities they need — all within the framework of our Information Systems Architecture.

We have entered the general-purpose computer industry from another position of strength. We have built our 3B computer line around a powerful and widely accepted software standard — the Unix operating system.

Unix System V, introduced by AT&T in January 1983, is the latest version of the popular operating system created at Bell Laboratories. Unlike other operating systems, Unix System V is a highly portable, multitasking, user-friendly, multiuser system. It is designed for use in nearly any computing environment, from office automation to software development.

The popularity of the Unix operating system began in the classroom. In the early '70s, Bell Laboratories began licensing Unix to universities for a nominal fee. Nearly 90% of U.S. computer science curricula have incorporated the Unix system, and over 100,000 programmers are fluent in the C

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language in which it is written. Many of these programmers joined independent software companies, where they have written and developed applications packages.

The Unix operating system is a unifying factor in the computer industry and is becoming a de facto standard. Before its arrival, the microcomputer, minicomputer and mainframe markets were relatively separate. With the advent of a truly transportable operating system, these segments are beginning to share software and services.

In order to hasten its acceptance as the industry standard, AT&T began aggressively licensing Unix System V to commercial software developers in January 1983. Response from the programming community has been enthusiastic, and in May 1984, we announced a Vendor Involvement Program through which AT&T will analyze and license Unix System V software packages developed by qualified independent vendors. AT&T will also publish a catalog of available Unix System V software.

In addition, our commitment to a Unix-based system further enhances the potential for upward mobility. Since Unix System V is a transportable operating system, applications developed in the C language can be transferred vertically, between different models in our product family, as well as horizontally, to computers from other vendors. This flexibility helps keep software costs down and protects a customer's investment in an installed base of applications programs.

FLEXIBILITY IS A KEY element in the philosophy of the new AT&T. We are looking to provide customers with total business system solutions — not just for today, but for many years to come. Toward that end, we have created Information Systems Architecture, a clear path to the future — and one designed to protect our customers' investments in installed hardware and software.

Under the umbrella of Information Systems Architecture, we give customers today's state-of-the-art technology coupled with growth capabilities for their business automation systems. It offers business customers of all sizes the potential to expand or change systems while protecting their investment in terminals, wiring and computers.

Our open Information Systems Architecture will provide compatibility and integration for the information technology industry. For instance, we have developed the specifications of our Digital Multiplexed Interface in conjunction with computer vendors, in order to facilitate the marriage of our communications systems and other vendors' data processing equipment.

In the past few months, we have announced plans for information transmission between our product family and processors from Hewlett-Packard Co., Honeywell, Inc., Data General Corp. and others.

Since Unix System V is a transportable operating system, applications developed in the C language can be transferred vertically, between different models in our product family, as well as horizontally, to computers from other vendors. This flexibility helps keep software costs down and protects a customer's investment in an installed base of applications programs.

But success in the intensely competitive business computer marketplace often demands more than a good product. As technology becomes increasingly sophisticated, each vendor must provide strong support to back up its hardware. AT&T Information Systems, with 27,000 technicians in more than 900 service locations, has the largest corporate service force in the communications industry.

Service is just one of the cornerstones of our strategy to provide systems solutions for U.S. business. The provision of such solutions is in keeping with AT&T's heritage of quality, craftsmanship and accountability.

We believe that the AT&T products we have introduced in the past year and a half establish the

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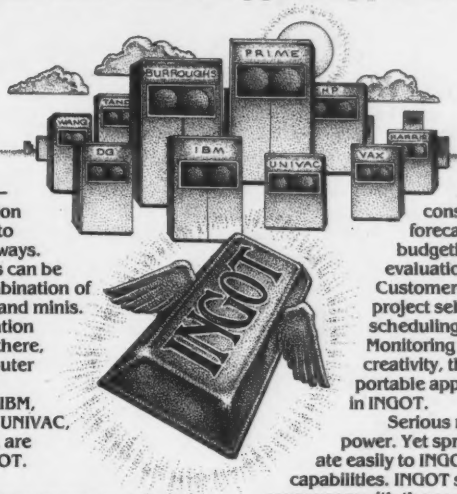

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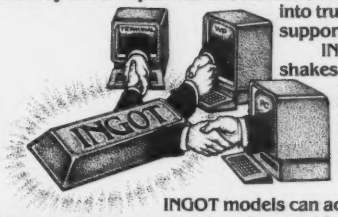

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The introduction of the new 3B family of computers is no exception. Many steps have been taken to ensure that AT&T's century-old tradition of service and support carries over into the computer arena.

BY YEAR-END, OVER 6,000 AT&T Information Systems sales and technical personnel will have been trained on these new products. These employees will use that training and their knowledge of the data processing marketplace to analyze customer needs and offer appropriate solutions that solve business problems.

At the same time, our AT&T Information Systems service force is being trained on the new hardware and software. In keeping with our tradition, they will provide unparalleled after-sale support.

Included in that support will be a toll-free customer assistance number that provides one-call maintenance service for AT&T's computer products and a wide variety of highly flexible service support options.

Since the birth of our company, we have introduced flexible upgrade policies, volume discounts, purchase or lease options and third-party financing to make it easier for customers to do business with us.

We have taken another important step to help customers feel confident about purchasing an office automation system from AT&T. Earlier this year, we signed a contract with CMI Corp., the nation's largest reseller of communications systems, to develop a third-party marketplace for previously owned AT&T telephone and data equipment.

When the program gets underway in 1985, it will provide customers with investment protection for their new communications equipment by helping them find buyers for their current AT&T systems.

In order to help customers realize the full potential of their information management systems, we created the Customer Management Institute. It is a set of courses designed to familiarize customers with their voice-and-data communications equipment. New classes have been added to help explain the power and flexibility of Information Systems Architecture and the 3B computer family.

AT&T plans to bring business customers the full benefits of communications and data processing technologies. We have linked the power of the Unix environment to an open architecture and have brought to bear the knowledge and commitment to service that people have come to expect from AT&T.

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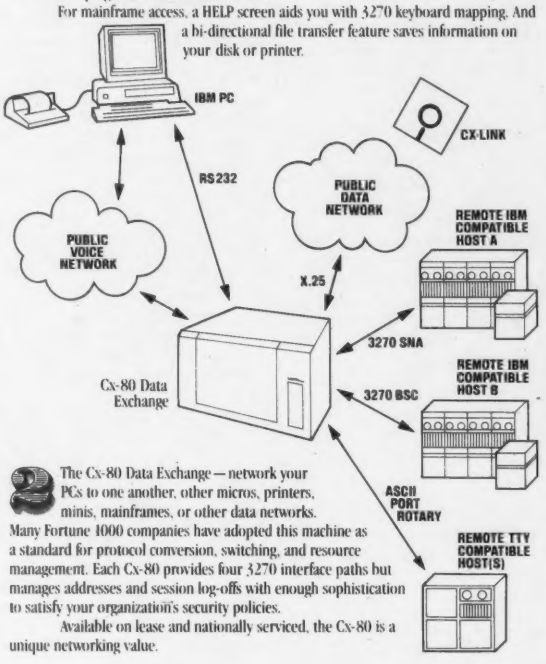

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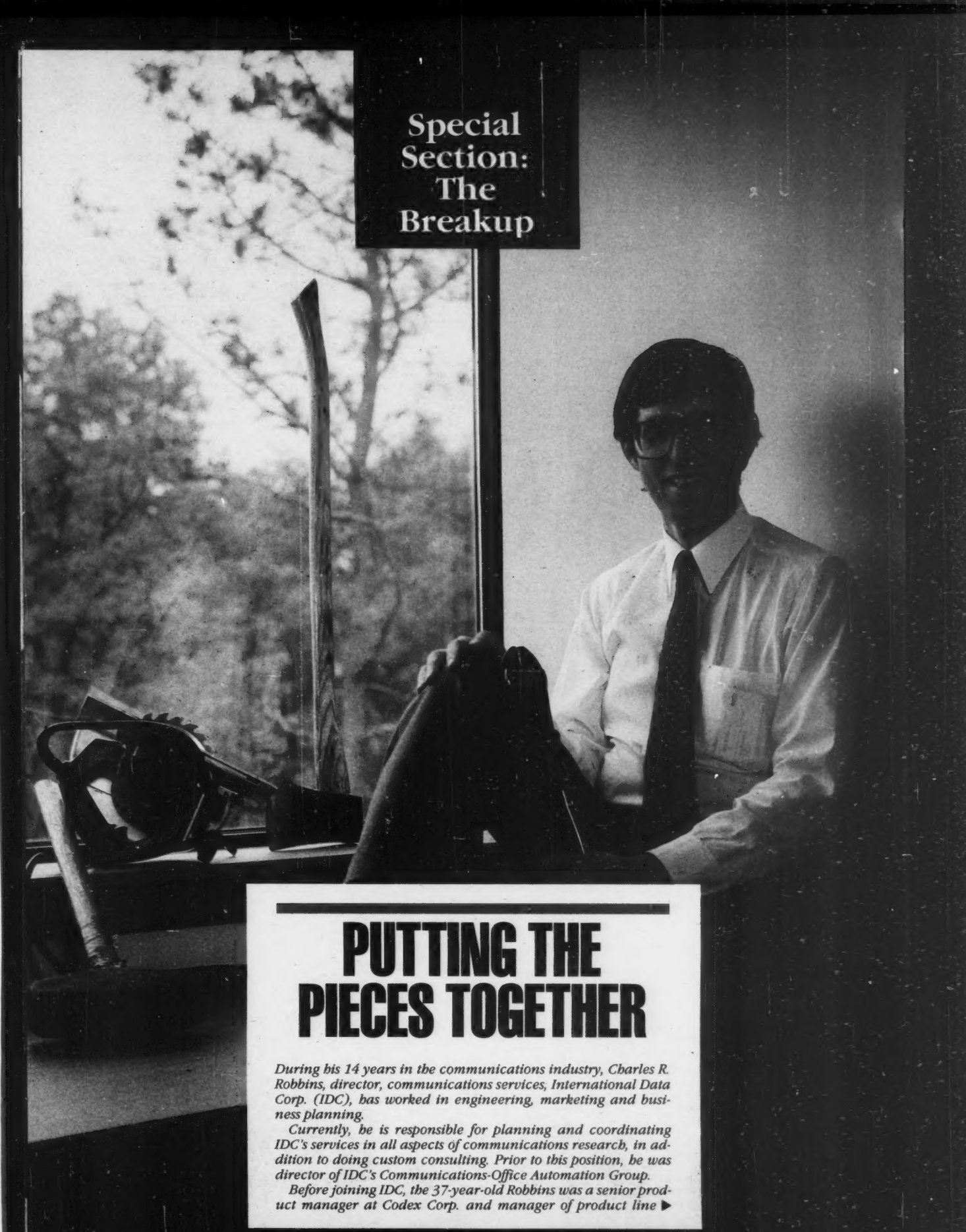

Special Section: The Breakup

PUTTING THE PIECES TOGETHER

During his 14 years in the communications industry, Charles R. Robbins, director, communications services, International Data Corp. (IDC), has worked in engineering, marketing and business planning.

Currently, he is responsible for planning and coordinating IDC's services in all aspects of communications research, in addition to doing custom consulting. Prior to this position, he was director of IDC's Communications-Office Automation Group.

Before joining IDC, the 37-year-old Robbins was a senior product manager at Codex Corp. and manager of product line ▶

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Charles Robbins

marketing with Intertel, Inc., recently renamed Infinet. His responsibilities have included product marketing and market planning for a complete line of data communications equipment, as well as developing market business plans.

A frequent speaker at industry conferences, Robbins spends most of his spare time with his family, with whom he enjoys stamp collecting, camping and fishing.

During a recent conversation with Computerworld On Communications *Editor Bruce Hoard, he discussed the state of the communications industry six months after the divestiture of AT&T.*

How would you describe the current state of the communications industry?

I would say it's in a state of flux right now. There are a lot of start-ups offering new technology, which is a very positive side of the opportunities for users as well as vendors. There are a lot of new technologies that at one time would not have been able to see the light of day. From the perspective of new ideas, new technology and a highly competitive environment, it is hard to keep the i's dotted and the t's crossed right now.

How have users benefited from the breakup?

I think users have benefited in the sense that they will see new ideas and new levels of capability being brought in that they would probably never have seen. The breakup is forcing AT&T not only to get competitive, but to be willing to open its kimono and talk more thoroughly about its plans.

AT&T is also moving toward a series of joint ventures. I think the true characteristic of communications in the '80s is a constant flow of joint ventures and alignments. They will benefit the user because they will offer the users more turnkey integrated solutions.

How have users been harmed by the breakup?

You could talk about this for hours. The guy who is just trying to get a simple line is waiting anywhere from three to six months. The whole process — what he does when he puts in a new line, who he calls, how long he waits and who he interfaces with — is very confusing.

Those issues are better defined than they were Jan. 1, but the time frame is still horrible. Now, for the newer technology capabilities of T-1 and [Dataphone Digital Service], time frames are even further out, but a lot of companies are willing to wait for those because there are inherent advantages they will get out of T-1 ability that go into their future planning. But the guy that just needs an analog line is already frustrated because he is going to be paying a higher tariff, and he finds that he is not getting the support. The Bell operating companies lost a lot of people to AT&T Information Systems initially, and there was a restructuring and choosing of allegiances. They have taken those people and are trying to integrate them into AT&T Information Systems. The feedback that I am getting is that there is support but it is very hard to pinpoint who to call, and that has been a big [source of] impotence for network management and the whole orientation of test equipment.

It is critical that you know exactly what is wrong because you have to know who to call. There is an interface responsibility being better defined, but there is second- and third-party interaction there. The feedback that I've heard is that it's going be bad for a long time, and people are looking at other alternatives, putting in a microwave dish so they are not as dependent on the local lines. I think we are going to see more and more of that type of thing.

How has the growth of new technology been stimulated by the breakup?

It is a big business opportunity to sell into large distribution channels. Many companies wrote business plans based on the divestiture or the thought that there would be a breakup and an opportunity to sell new products.

What specific areas of technology have gotten the most stimulation?

I think right now the more mundane areas have: the area of new generation [private branch exchanges]. The fact that the [Bell operating companies] don't want — and in most cases have not gone with — the Western Electric [Corp.] approach has opened up the market for traditional PBX firms. It has also provided hope for an opportunity to the Ztel, [Inc.'s] and CXC [Corp.'s] of the world, although that is low-key — an ongoing kind of development.

The other thing is that the telephone company needs equipment that will help generate traffic on its network for all of the enhanced services capabilities. The X.25 movement that it is making is an opportunity now for companies to sell that technology. X.25 was not really new technology, but we are going to be seeing a lot of different approaches.

You will also see tremendous growth in system integrators taking technology that is developed

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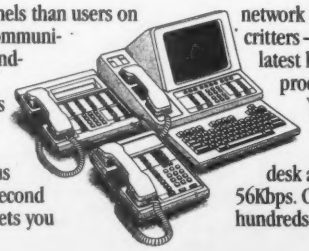

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and trying to do tenant services on orientation. I think that is another big thing that has evolved from the unregulated environment and the whole divestiture opportunity.

What vendors have cashed in on the new industry environment?
Early on, I would say, it is the big guys, the Northern Telecom, [Inc.'s], the people who have been well-conditioned and have tremendous credibility in the business. There have been success stories on the part of young start-ups that are being invested in by the [telephone companies]. One example is Northern Technologies [Ltd.], in Chicago. They are in the business of slow-scan video, looking at different ways to have very heavy resolution over very low speed. The attraction there to Ameritech, which is one of the prime investors, is that it will give people a reason to use the network.

There is a litany of people who have gotten venture capital investment just because of the environment. In the local-area network business, young companies like Proteon [Associates, Inc.] have signed agreements with the [telephone companies]. I think you can see more of a trend as the phone companies buy equipment.

How is AT&T Communications doing?
It depends who you talk to. When I talk to them, they tell me things are going according to plan. I would say that AT&T Communications is in a battle for [its] bread-and-butter business, which is basic long-distance telephone calls. The full extent of that may be a lot more serious than people think. I think the battle is one of the reasons I have been a little bit concerned about prospects, because bread-and-butter business is long-distance services.

With equal access, there really isn't much differentiation. You don't always need to call somebody in Timbuktu. I believe that it bodes a serious ongoing problem, and they are expecting to lose more market share. But on the positive side, they are in the forefront of a lot of the new technology. [They are] especially involved in fiber optics and in all aspects of enhancing and improving their network. But the big hope for them is the [integrated services digital network]. I am not convinced that it is necessarily going to happen as quickly as they say.

What are the issues concerning the total deregulation of AT&T Communications?
AT&T Communications is in an environment where it is a regulated carrier, and it has had a tremendous amount of inconvenience and expense thrown on top of it. One of the biggest frustrations right now is the degree of record keeping that they still have to give to the [Federal Communications Commission]. Another frustration is the control that the FCC still seems to apply, for example, saying, "Look, we don't agree with these recommendations. You're going to drop your price 6%."

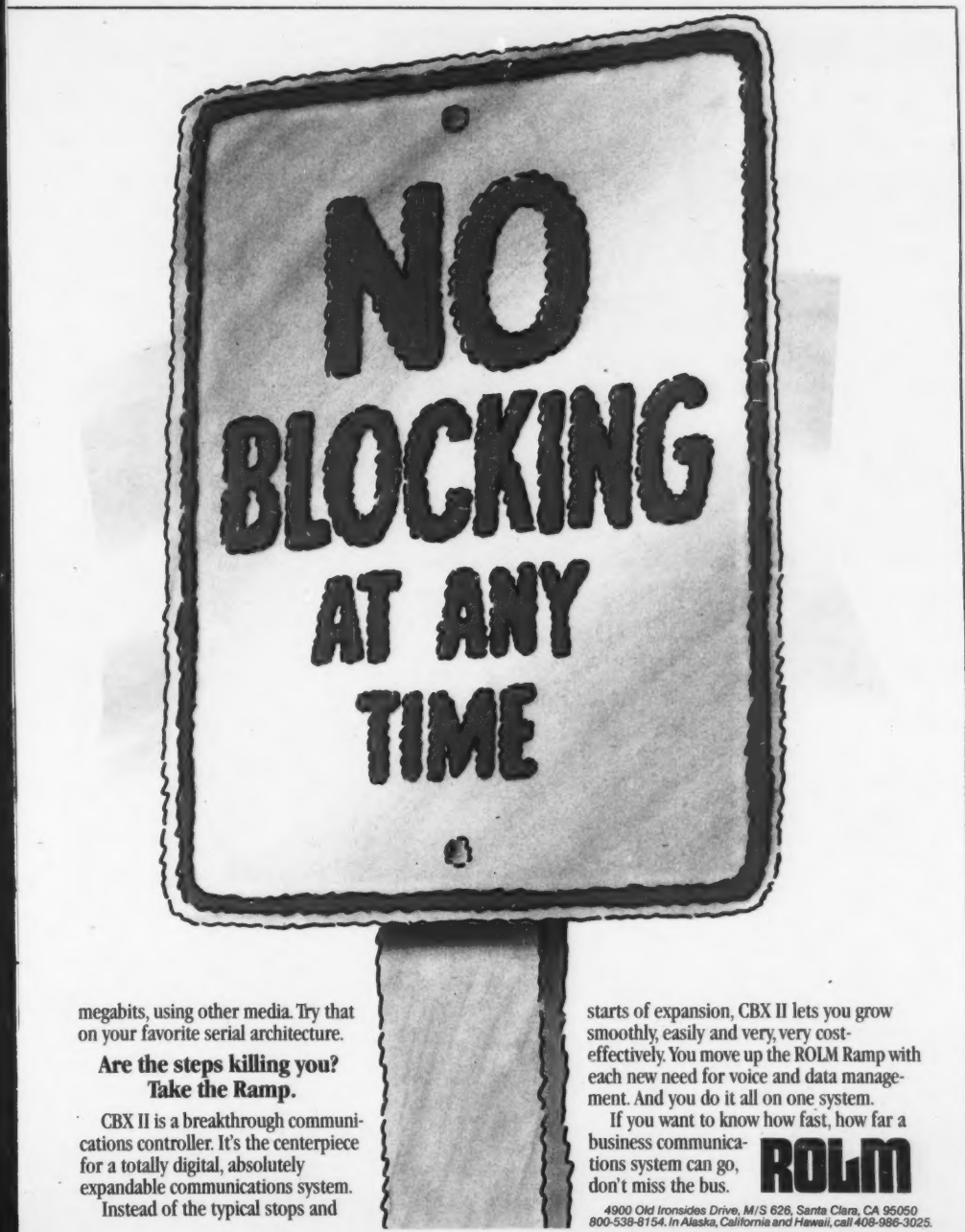
That type of thing clearly has a good side, and then probably

With equal access, there really isn't much differentiation. You don't always need to call somebody in Timbuktu. It bodes a serious problem, and they are expecting to lose more market share.

AT&T Communications felt it needed to discount its service anyway. But it still does not have the control. It cannot directly enter new businesses. Computer Inquiry II has been a very difficult thing from the point of managing the company. There are a lot of separate facilities. It's hard to coordinate within the company, and I think that has really hurt them initially. There is a lot of work ahead in developing some of these new technologies and holding the base of long-distance customers that they have. Getting into any other businesses, to my knowledge, is a very closely controlled issue for them.

What do you hear about AT&T Information Systems?
That is an area I'm much more privy to. There are a lot of rumors about defection, a lot of rumors about people leaving: There are a lot of rumors about everything. The bottom line is, you're not going to see this company get itself together in the way that it needs to for at least another year or two. There are a lot of issues ahead in the computer business. The computer business was necessary for them, but it is a long row to hoe.

As far as the PBX is concerned, I'm starting to be more impressed with what I see coming out of that area from them. I'm starting to see — as they begin to announce the direction of Information Systems



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Architecture and tie things together — a lot more competitiveness in their PBX business. I was impressed with the System 75. It has a lot of enhanced capabilities that other systems in that range don't yet have. I think the key for that is to tie this particular product line into other products that they are selling, such as Net 1000, which I have very major concerns about right now.

I was going ask about Net 1000. It seems to have been languishing out in purgatory for a long time.

Yes, I have major concerns about Net 1000, and I have talked to other people about it. I don't know if they can get out of it; I believe they are committed to it. But I believe they are going to look at other joint ventures to bring that to the market. First of all, there aren't enough nodes to go nationwide to support the Net 1000 users. The feedback that we get is not very positive, but I think the concept is a good one.

There are a couple of issues. Will people really have their programmers writing stuff in Cobol? Will they look at a private network? If they have staffs of programmers and technical people, why do they want to go into a public network in the first place? So those kinds of concerns probably have hurt in some ways. They will be doing some other software things, whether that means working with other companies or hiring software help. And if they do tie Net 1000 together with their PBX, offer their computer systems and their terminals, they have sort of a synergistic approach here. Perhaps that's what Information Systems Architecture is all about. I'm aware they are going to be making some major announcements this summer about it.

How do you feel that the Bell operating companies are doing?

The first quarter was phenomenal. I was surprised. I didn't think they would do so well. I think that part of it, of course, is they streamlined some of their staffs. And the second thing they've done is bring in new blood. So the prospects look pretty good for most of them because they're becoming distributors. They're going to the people that they know well.

One of the things they will probably wind up doing is develop niche strategies. They will be most comfortable with small and medium-size businesses, and they are going to lose a good portion of the larger customers over time. You cannot fight private nets if you are a $3-billion dollar company. There's no way you are going to deal with the telephone company. You may go to AT&T for a private net. That is a possibility of the future, you never can tell. Most of them are willing to enter a lot of joint ventures, thus they get a lot of young companies. I'm impressed with Ameritech because it has been willing to develop a venture capital arm. I would expect other firms will be doing that type of thing too.

Will the Bell operating companies be allowed to offer enhanced Centrex services?

It's a tough one to call because it now moves a little bit into the grey area. I'm going to be a betting man and say yes. But again, they are so committed to Centrex — to holding the base of Centrex users that they have. It is still a major part of the revenue stream, but they know that with the access ruling — unless they offer enhanced services and help subsidize these Centrex users — there is no way they are going stay with Centrex. And if not, they will probably wind up migrating, and AT&T hopes they will migrate to an Intecom, [Inc.] switch sold by Nynex.

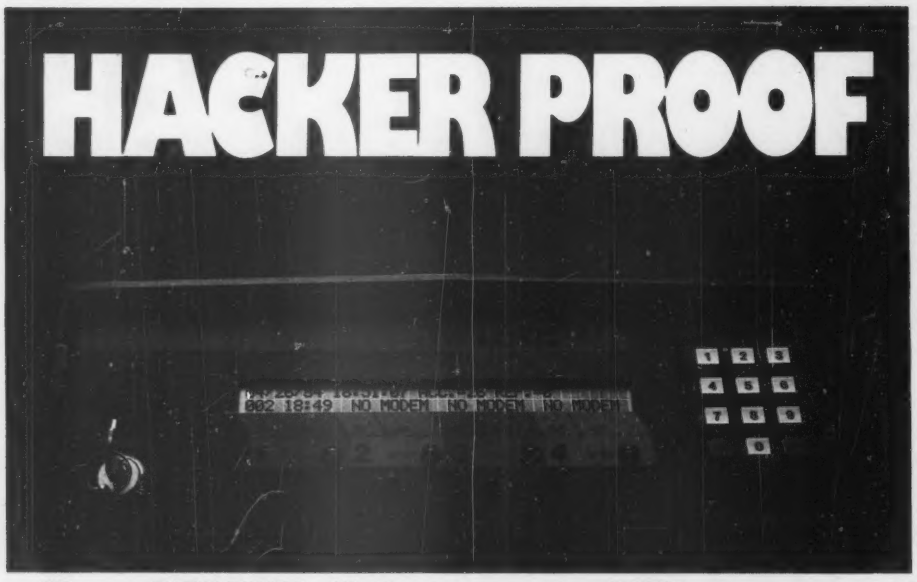
The Bell operating companies are still looked on favorably by the Public Utility Commissions and certainly by the FCC. It seems that they are treated a bit like — not pets — but treated well.

So they have their fingers in both pies, but I think they are very committed to the Centrex users, and they are pushing it.

The Bell operating companies are still looked on very favorably by the Public Utility Commissions and certainly by the FCC. It seems to me that they are treated a little bit like — not pets — but treated well. They have the resources to become very major factors in a lot of the enhanced services businesses, videotex and other areas.

What can communications users, in general, expect for the remainder of this year?

This year, more of the same. People that are getting support will begin to see a little more formality, a little more control on the other end. ■



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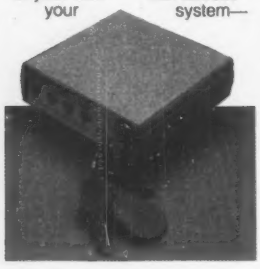

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KEEPING A DOGGED WATCH ON TELEPHONE USE

BY DANIEL I. STUSSER

Call-accounting systems are giving managers a revealing look at what their employees are doing with their telephones. One of their most popular features is station message detail recording (SMDR), a software feature that provides individual itemizations of each telephone call, including the extension number, date and time, digits dialed, trunk used, call duration and optional fields such as account ▶

Stusser is a telecommunications consultant based in Morristown, N.J., and author of Profit and Control Through Call Accounting *(The Telecom Library, New York).*

KRISTIE VAN VALKINBURGH

code and authorization code. These call records can be for incoming and outgoing calls and are the material used by call-accounting systems to generate reports.

Telephone station users are often a little disgruntled when they learn their employer is installing a system that not only records each outgoing phone call but prices each call and might also draw conclusions about the destination and purpose of each call.

On the other hand, telecommunications managers are usually pleasantly surprised when they find that their toll bill drops by double-digit percentages immediately following the announcement of the SMDR processing system. One company in Boston decided to cancel its order for a call-accounting system when it realized it would accomplish its goal of cutting telephone abuse simply by announcing that all outgoing calls would be logged by the new computer system. The Wats bill dropped by 17% the next month.

There are many cases in which actual call-accounting reports have been used to cut long-distance bills by as much as 40%. Consider a company in which employees spent every lunch hour talking with their mothers in faraway locations, thinking that it was okay because, "The Wats line is free, isn't it?" A call-accounting system would be helpful at a firm where the DP department connected the modem and sent billing records to headquarters when the line was free at lunchtime, instead of waiting until 5 p.m. when the rate goes down 40%.

But abuse and misuse of the telephone lines are just two reasons so many users are buying call-accounting systems. The biggest reason manufacturing firms and general business customers are using call accounting is to allocate their local, long-distance and telephone equipment costs to the divisions, cost centers, departments and people who use them. Allocation reports can include a built-in profit that lets the telecommunications department operate as an internal profit center.

Professional service firms, such as lawyers and engineers, use call-accounting systems to bill their clients for calls made during a project. Modern private branch exchange (PBX) and key systems can often be programmed to require that an account code be dialed into the system before an outgoing call is connected.

Most law firms have either been logging calls manually or using hotel-type circuits that cost operator-assisted rates and still require extra effort on the part of dialers. One New Jersey consulting firm that had been using a manual system found that 72% of its total calls were business-related when it went to a forced-account, code-entry system. This firm uses only a five-digit account code, but some PBX call-accounting systems process as many as 18 digits.

HOTELS SPURRED the greatest increase in call-accounting products. When AT&T announced in 1981 that it intended to stop paying hotels the 15% commission on operator-assisted long-distance calls that guests made from their hotel rooms, hotels sought ways to make up the difference.

Hotel call-accounting systems are now made by more than 30 suppliers. Some systems have over 40 feature differences and deciding between one black box and another is often as difficult as deciding on the PBX itself. Timing the duration of the telephone call is tricky with any of the call-accounting systems on the market, but is particularly important in a hotel system. If the call is too short to be captured by the system, the hotel pays but cannot bill the guest for the call. If a guest dials a number and the other party does not answer in three or four rings, he might be billed for the call even if he is never connected.

Other users of call-accounting systems are companies that share or resell their long-distance networks. Since the Federal Communications Commission stopped requiring that resellers be licensed, thousands of companies have become involved in these situations. Because call-accounting systems price calls in any way they are programmed to do so, they are ideal billing systems for resellers that bill at X% below AT&T Direct Distance Dialing rates or that use a different call pricing formula.

Hospitals, in particular, are buying call-accounting systems for three reasons. First, hospitals are major telecommunications users, and the systems help them manage their networks and costs better. Second, the system allows a hospital to resell long-distance telephone services to patients, providing additional revenues and a larger long-distance network that can provide better economies of scale and lower actual costs to the hospital. Third, hospitals are buying call-accounting systems to meet requirements of third-party insurers who require that they separate therapeutic costs from optional service costs.

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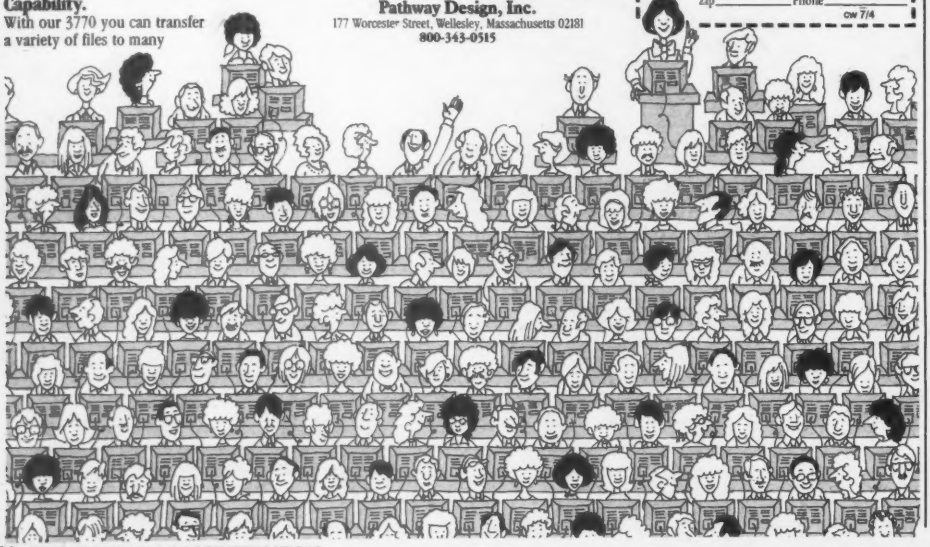


depend on call-accounting reports for information that can help them make their salesmen more productive, to watch for abuse of Wats lines and to manage their long-distance networks.

So why is call accounting such a hot topic this year? There are eight factors.

■ *Divestiture.* The AT&T divestiture has thrust the phone bill to the forefront of every business telephone manager's mind. He knows he is alone when it comes to managing costs, and many managers see that call accounting can help with that task.

More managers are understanding the relationship of their PBX routing system to their network costs and see call accounting as a neutral way to help them interpret their needs and solutions.

■ *Multiple vendors.* Every business and residential telephone customer now must coordinate at least three vendors, one for equipment, one for local service and yet another for long-distance service. Three years ago, this was the case for some businesses, but now it is the same for all customers.

Call-accounting systems often provide the crucial information needed to stop bickering telephone companies from pointing fingers at each other and start them working to get a trunk or trunk card fixed quickly.

■ *Decision time.* Millions of customers renting their equipment from AT&T have been waiting for some mythical dust to settle this year before they decide whose equipment to buy. At midyear, equipment makers are struggling to keep up with the demand for their systems. A higher percentage of these key and PBX systems are being installed with call accounting as part of the package.

Since call-accounting systems generally cost 10 to 15% of the price of the systems they work with, for systems with more than 50 lines, the cost is not as much of a factor as the added value of the call-accounting information they provide. Sometimes a PBX is selected because of the call-accounting features it will provide.

■ *SMDR.* This is a standard feature of almost every PBX being sold today and of most electronic key systems with more than 10 outside lines. This feature provides a record of each call and simplifies the addition of call-accounting processing. The RS-232-C port for SMDR is easy to attach to, and call-accounting vendors routinely write new interface formats for any PBX or key system.

■ *Long-distance tariffs.* These tariffs are confusing and change frequently. This adds to the difficulty of designing a long-distance network and, for large users, suggests the need for outside assistance in keeping track of network costs. Call-accounting vendors are such specialists, and users often find that such management assistance is as useful as the call-accounting reports themselves.

■ *Flat rate facilities.* These facilities are becoming rare in many areas of the U.S. Local lines are metered in most large cities, and flat rate long-distance facilities, such as foreign exchange and intra-Local Access and Transport Area and intrastate Wats, are not being offered or are prohibitively expensive. Call-accounting systems can show when there is enough traffic to justify the installation of a foreign exchange line, or when it should be removed. Along with the ways they help a manager optimize his network, these systems are useful in reacting to this added change in the services marketplace.

■ *Multilocation companies.* Such firms need centralized control of their telephone costs and services. Communications among locations of the same company sometimes comprise up to 80% of a location's outside telephone calls. Here is an opportunity to manage both telephone costs and people costs. If a call-accounting system demonstrates that two people are spending a significant amount of time working together on the telephone, those people can be moved to the same office, eliminating significant telephone costs.

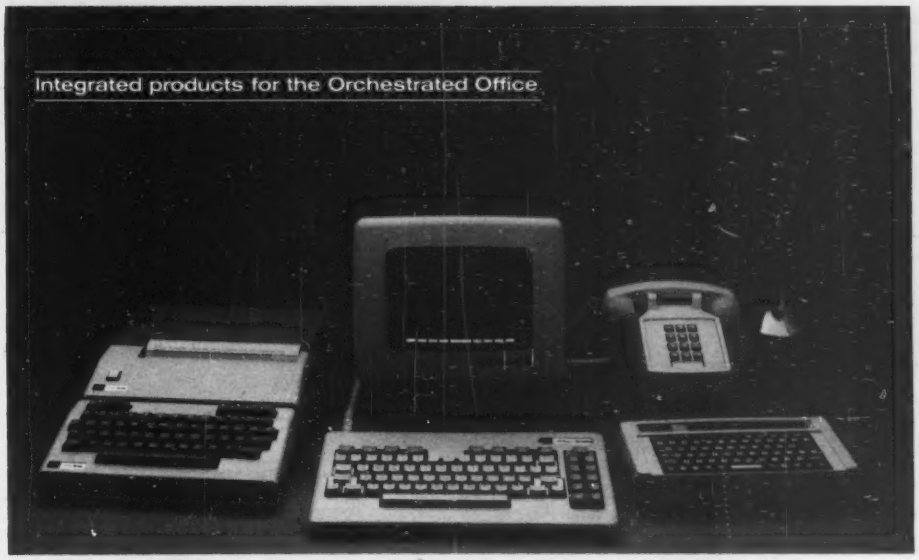
Many of the newest call-accounting systems can be polled remotely and can thereby provide local on-site reports and centralized reports to headquarters.

■ *Computer prices.* Prices have plunged while computer capabilities have soared. As a result, the call-accounting system that was unaffordable five years ago is now inexpensive. Many of the stand-alone call-accounting systems on the market today are built around off-the-shelf microcomputers such as the IBM Personal Computer.

Some analysts predict that more computing power will be shipped this year than in all previous years together. A safe assumption is that the same should happen in the call-accounting marketplace.

Call accounting is so important a tool that over 90 companies are concentrating their efforts on it.

There are three techniques available for call accounting. The most well-known type is the stand-alone processor that attaches to a company's telephone system and collects and processes call records into call-accounting reports on-site. There are more than 150 different models



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Whisper Reader: a terminal that weighs just 2 lbs.

This book-size unit does most of what Whisper Writer does, with the obvious exception of printing. Like Whisper Writer, it lets users prepare text off-line to save on telephone, TWX, and Telex charges.

Whisper Screen: a smart terminal that communicates.

3M's intelligent CRT terminal has a standard RS-232C interface, plus a built-in modem for communications at 1200 or 0-300 baud. A 16K memory with print spooler is standard, as are a variety of automatic dialing, log-on, polling, and answering features.

Hard copy output for both the Whisper Screen and Whisper Reader is provided by 3M's complete line of low-cost, quiet Whisper Printers.

Obviously, there isn't room here to describe the attributes of 3M's Whisper Terminals in detail. For the full story – and for a brochure on other 3M products for the Orchestrated Office – call toll-free or mail the coupon today.

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available in the U.S., and they range in price from about $1,200 to more than $150,000.

Service bureaus provide monthly processing of reports either by polling a call record storage device located at the customer's location or by processing a magnetic tape sent by the customer or, in the case of Centrex customers, by the telephone company. Service bureaus charge by the month for their reports, either by the call record or by the number of telephone instruments. Either way, the cost ranges from about $1 to $2 per station per month.

Call-accounting software is the third method available to users. Until recently, software was available only for the large mini and mainframe computers typically operated by an organization's data processing department. In 1983, several suppliers started offering stand-alone systems built around popular microcomputers operating under Microsoft, Inc.'s MS-DOS, Digital Research, Inc.'s CP/M and Apple Computer, Inc.'s DOS. Some vendors offer software for these systems.

Most of the 40 or so packages on the market are for larger computers. The cost ranges from about $5,000 to $90,000 for an integrated package with other telemanagement software including telephone operator directory, facilities management, cable records maintenance and message center software. Choosing among methods is not simple, and neither is choosing among products once you have decided which method to use. For some companies, such as hotels, a stand-alone box is the only solution. For most, the method can be as important as the particular vendor.

More products are coming to the market each week. Most are only minimally tested before they are installed in the first customer locations.

One exhibitor at the May International Communications Association Convention in Las Vegas had a new stand-alone system on display, based on an off-the-shelf microcomputer. It didn't seem to work yet. The literature was pretty; the words believable. Finally, the vendor admitted, "This is just a demo. We just decided to build this last Wednesday." ■

Major Reasons To Track Calls

Almost any organization with a private branch exchange (PBX) or key system can make good use of call-accounting reports. There are 10 major reasons for call accounting:

1. *Abuse control.* The best-known use of station message detail recording (SMDR) and call accounting is to control telephone abuse — and abuse is theft. Such theft is estimated at up to $4 billion a year.

2. *Misuse control.* Poorly designed least-cost routing schemes and poorly trained employees dial calls on the wrong facilities or at the wrong time. These patterns are seen with call-accounting reports.

3. *Cost allocation.* Companies can allocate their telephone expenses to departments and individuals just as they allocate credit card travel, office equipment and salaries.

4. *Client billback.* Professional firms can now provide inexpensive, detailed listings of all telephone calls made during a client engagement. They can also add a percentage surcharge to their costs.

5. *Share and resale of telephone services.* The minimum requirements are customers, a PBX, telephone circuits and a call-accounting system.

6. *Management of sales and customer service departments.* Call-accounting reports show which customers were called, how often, by whom and for how long. Experimenting with requirements for telephoning workers can be done with hard copy proof of the results.

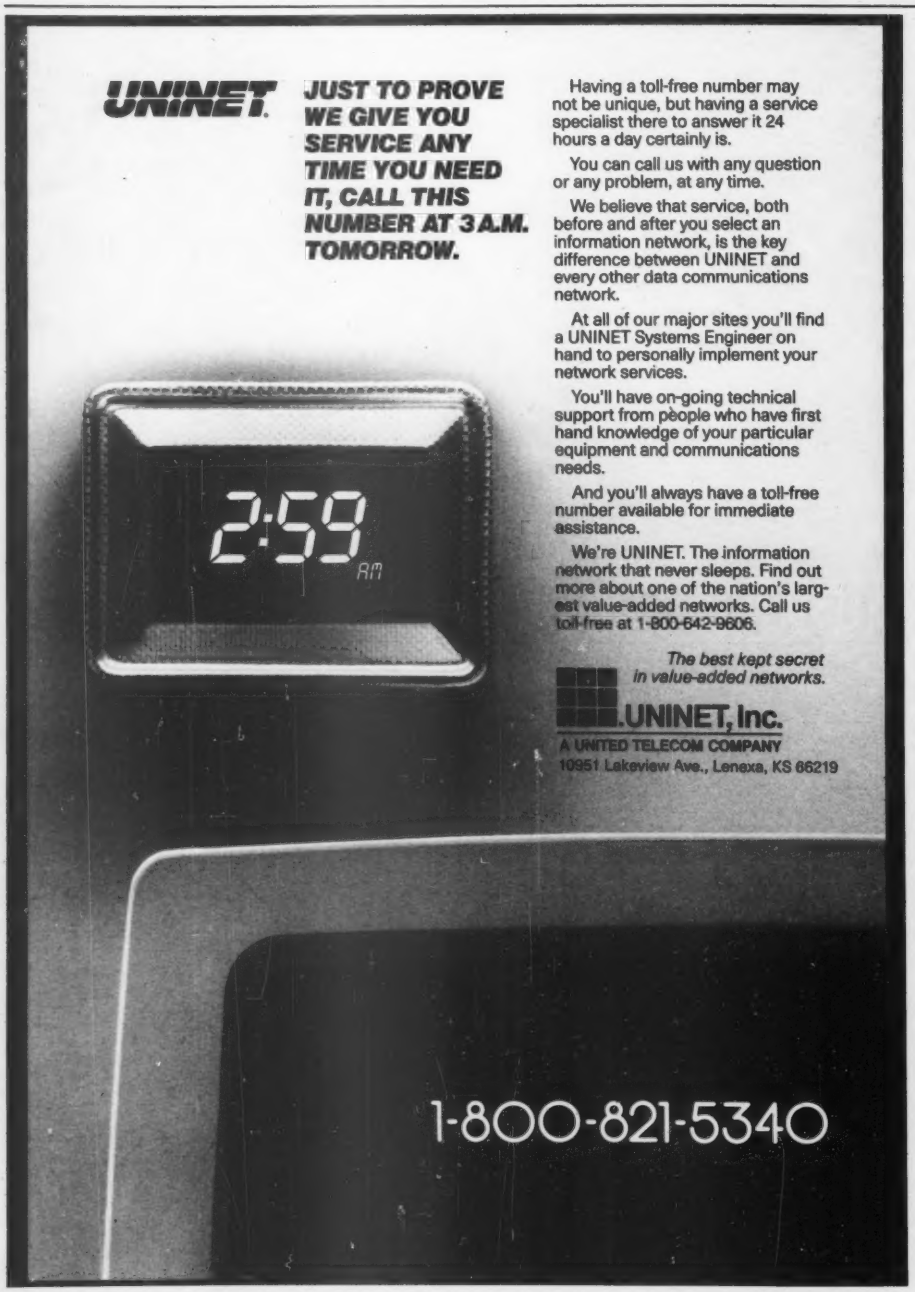
7. *Personnel evaluation.* Depending on the job an employee has, the amount of time he spends on the telephone can show a manager whether he is working hard or goofing off.

8. *Partial PBX diagnostics.* Call records show which trunk was used for which calls and how many calls each trunk handled. The reports can pinpoint trunks that are down. Some PBXs send diagnostic reports through the same RS-232-C port that the SMDR call records come through.

9. *Long-distance bill verification.* A call-accounting report shows every call made outside the telephone system and can be used against the long-distance carrier's bill to determine if a call was made.

10. *Network optimization.* Deciding which long-distance services to buy and how many circuits to have is among the trickiest problems a telecommunications manager faces today. In order to make informed decisions, a manager must know where his people are calling and how often. This information is only available from call-accounting reports.

— *Daniel I. Stusser*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TELECOM COMPETITION, EUROPEAN STYLE

BY BRUCE HOARD

The United Kingdom and the Federal Republic of Germany. Two different nations, two different national telecommunications strategies. The UK is following in the competitive footsteps of the U.S.; West Germany retains a monopoly.

In the UK, British Telecom, which serves England, Scotland, Wales and Northern Ireland, maintained a monopolistic stronghold on national telecommunications until the British Telecommunications Act of 1981 was passed. That law provided for the separation of British Telecom from the national post office, gave government the power to license other telecommunications systems and set the liberalization of the manufacturing marketplace in motion.

Another bill, which is expected to become law later this year, would establish the Office of Telecommunications with a mandate to maintain and promote effective competition.

The first telecommunications system to be licensed under the 1981 act was that of Mercury Communications, Ltd., a little-known company in the U.S. that was licensed in 1982 to compete with British Telecom. Under terms of its license, which runs for 25 years, the government may license no other competitive network until 1990.

The company is jointly owned by Cable & Wireless PLC, British Petroleum Co. PLC and Barclays Merchant Bank, Ltd. These firms have combined to invest 90 million pounds to date, and that sum is expected to reach 200 million pounds by the end of 1985. Cable & Wireless and British Petroleum each own 40% of the new venture; Barclays controls the other 20%.

The incipient company and its 300 employees are creating a network that will initially serve organizations with substantial information handling needs in London. Beyond that, Mercury Communications will expand to provide an intercity national network and, via satellite links, international communications. During these early stages of its existence, the company will offer ▶

Hoard is editor of Computerworld On Communications.

Mercury Communications battles British Telecom, while the German PTT stands alone.

PHOTO ©1984 ED BRAVERMAN

only leased lines with switched services to follow.

At the end of 1983, microwave links were in place connecting London and Birmingham, and those links are in the process of being expanded. Mercury Communications is laying monomode fiber-optic cable capable of supporting 560M bit/sec transmission along British Rail right-of-ways as part of a national backbone network that will be centered in Birmingham.

In addition, a southern loop will incorporate London and Bristol, with a northern loop that connects Leeds and Manchester.

Mercury Communications is laying monomode fiber-optic cable that is capable of supporting 560M bit/sec transmission along British Rail right-of-ways as part of a national backbone network that will be centered in Birmingham.

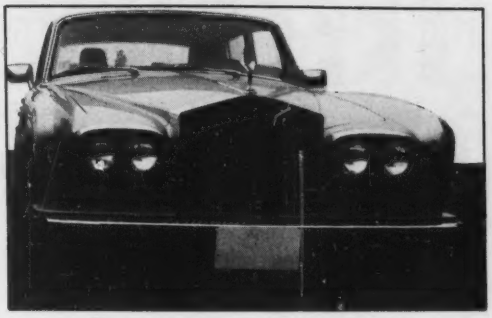
Typically, the trunk network will be terminated by "opto-electronic" equipment at or near railway stations to which each main city distribution center will be connected by cable, or through digital-microwave backhaul links. Central trunk distribution points will be linked to local distribution nodes by microwave links.

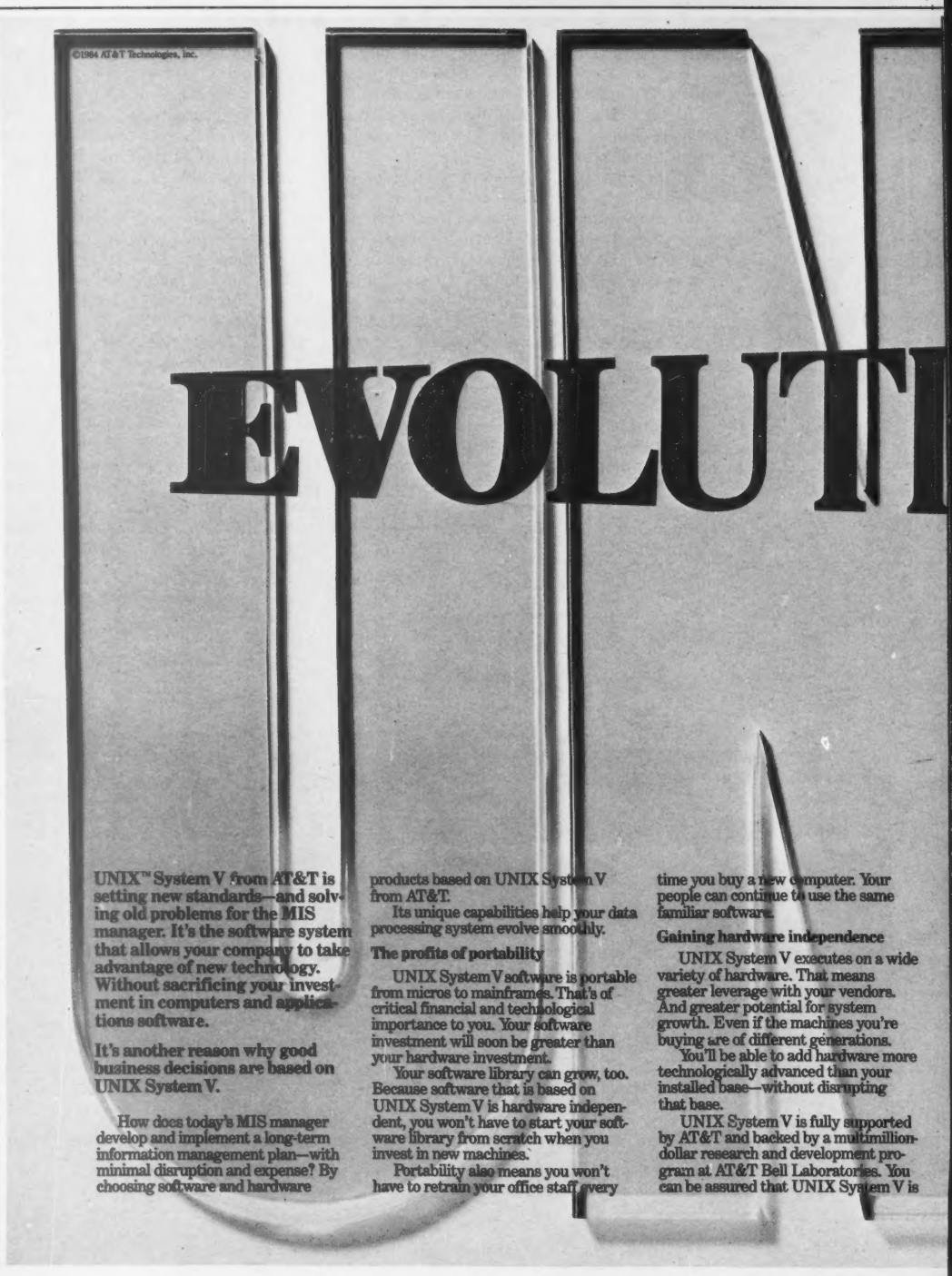
THE BRITISH firm's point-to-point transmissions are organized in unit circuits of 64K bit/sec and based on time-division multiplexing. Data is presented to the user in one or more 64K bit/sec or 2M bit/sec channels that can be subdivided into a mix of voice and/or data streams. At the upper end, Mercury Communications provides lines with capacities of 8M-, 34M-, 68M- and 140M bit/sec for video transmission. When switching is introduced into the network, circuits will be switched at 64K bit/sec.

In addition to standard voice and data services, Mercury Communications will offer such value-added services as electronic mail, video conferencing, data base access, digital voice store and forward, along with facsimile and graphics.

International services will start with a transatlantic link and subsequent connections will be made with continental Europe. In addition, satellite coverage will be used within Britain for program distribution to cable television operations and for access to areas not reached by the network and to offshore structures.

Satellite communications centers in London's Docklands section and in Oxfordshire will begin





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service this year.

According to Sandy Skinner, Mercury Communications' marketing communications manager, Mercury Communications has a lot to offer in the area of CATV services. "We can offer a very constructive, synergistic deal with any CATV operation," Skinner said.

"First of all, we can provide the trunks that link CATV head-ends. They can provide the end-delivery mechanisms, which we would find very expensive to implement by any other means," the marketing communications manager explained.

Skinner said the end-delivery mechanism gives Mercury Communications the means to penetrate to small businesses and even domestic premises that it would not be attracted to otherwise.

Because of government regulations, CATV carriers are licensed only to carry entertainment services. If CATV carriers wish to offer interactive services such as voice, they must do so through either British Telecom or Mercury Communications.

Skinner noted that British Telecom is not interested in helping CATV companies produce voice services that will compete with its own. As a result, Mercury Communications is able to offer the CATV firms a deal that includes interactive services and access to nationally based value-added network services.

This means that CATV firms can, in effect, become local telephone companies as distributors of Mercury Communications' services. "It's a hell of a deal," Skinner declared.

British Telecom is not interested in helping CATV companies produce voice services that will compete with its own. Thus, Mercury is able to offer the CATV firms a deal that includes access to nationally based value-added nets.

Why is Mercury Communications starting out with point-to-point leased lines? "We have no option," he replied. "You cannot switch a network until there is enough network to switch."

Mercury Communications' network is nothing more than a house of cards in the opinion of Franz Arnold, who is executive chairman of the West German firm, Scientific Control Systems.

Arnold is the former chief of the German Bundespost's telecommunications division. The Bundespost is the national postal authority in West Germany.

The Bundespost and similar organizations throughout Europe are generically known as Postal Telephone and Telegraphs, or PTTs.

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British Telecommunications Act of 1981, British Telecom was a classic example of a PTT. These organizations maintain monopolistic control over their countries' national telecomunications networks.

Asked to comment on Mercury Communications, Arnold, who spent 16 years with the Bundespost, said flatly, "It is quite obvious that the British example failed.

Arnold said he does not believe that West German switching and transmission services should be made private. "The American example does not work in Europe," he explained. "Deregulation in the U.S. is purely an American problem; you cannot compare it to Europe."

"It did not break the monopoly because the success of Mercury Communications depends on British Telecom," he added.

"If British Telecom would be a real competitor, Mercury would fail," the former Bundespost official noted.

He said it is "ridiculous" for British Telecom to provide interconnection for Mercury Communications and compete with the company at the same time.

In his opinion, Britain has replaced a monopoly with an oligarchy, and Mercury Communications will remain vulnerable to the whims of British Telecom for at least the next five years. Moreover, he added, British Telecom is subject to more regulations now than ever before.

Turning to West Germany, he called for liberalization of the national network, especially leased circuits so they can be more readily available to resellers and private value-added carriers. He pointed out restrictions he thinks should be relaxed, saying it is not presently permissible to mix leased circuits with the switched network.

He said he does not believe that West German switching and transmission services should be made private, as in the U.S. and UK. Such a drastic change is not politically feasible, Arnold pointed out.

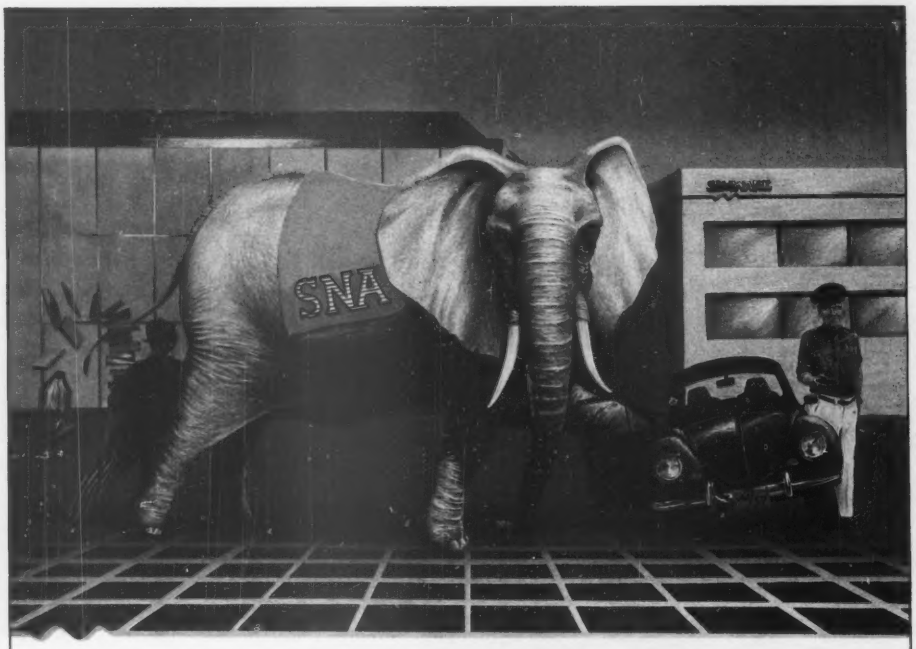
"The American example does not work in Europe," the executive chairman of Scientific Control Systems explained. "Deregulation in the U.S. is purely an American problem; you cannot compare it to Europe."

The West German private branch exchange (PBX) market is wide open for competition, something the PBX market in the UK is not, he noted. The West German terminal market is the most liberal to be found anywhere outside the U.S., Arnold added.

However, basic telephones and modems still fall under the monopolistic control of the Bundespost, which still gives type approval for terminals, determining which ones meet the correct technological specifications.

Recognizing the potential for conflicts of interest over type approval, Arnold and the Bundespost established a separate office of type approval in 1980. He maintained that political considerations do not come into play when the type-approval office presents rulings on network technology.

Before he left the Bundespost for a position in private industry, Arnold was instrumental in the



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formation of a commission that is investigating future telecommunications directions under the auspices of the West German cabinet.

ONE RECOMmendation of that commission that has not been put into action calls for volume-sensitive pricing for leased circuits. Such a move would expand network use and stimulate the growth of valued-added networks because it would allow resellers to lease lines at a fixed rate based on distance and resell them at rates based on volume of use, according to Arnold.

"The Bundespost has all these restrictions because they fear what happened in the U.S.," Arnold pointed out.

"In the U.S., people leased circuits from AT&T and then resold them," he said.

"The tariffs for the leased circuits were based on distance and the tariffs of the switched network were based on distance plus time or volume," he continued.

Despite the commission's recommendations, there has not been a rush of prospective value-added network entrepreneurs. Arnold said that is partly because big telecommunications manufacturers such as Siemens Corp. and Philips have not gotten involved.

According to Arnold, these large companies could play an integral role in the formation and operation of new networks, but they choose not to because they do not want to jeopardize their cozy relationships with the Bundespost that gross the companies billions of dollars every year.

Arnold said he is critical of the Bundespost's current direction because he feels it is focusing on television broadcast services to the exclusion of other, more business-oriented forms of telecommunications.

As a result, there are no current plans for the development and construction of a nationwide fiber-optic network, the likes of which Mercury Communications is building in the UK.

He said private companies, not the government, should preside over the proliferation of television services.

Although a group called the Conference of European Post and Telecommunications Administrations has met to discuss international networking, "it has not been very successful," Arnold maintained.

Speaking on the possibility of intra-European cooperation on an all-digital network, the former Bundespost official was not optimistic.

Although a group called the Conference of European Post and Telecommunications Administrations has met to discuss international networking, "it has not been very successful," Arnold maintained.

"It is very loose, and there has been very little remarkable progress," he said.

Although Britain has broken the mold, nationalism and nationalization — not deregulation — remain the hallmarks of European telecommunications. ■

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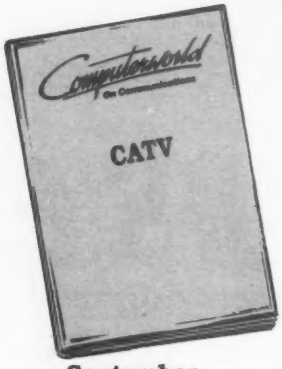

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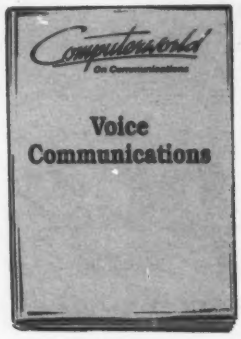

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HOW TO CHOOSE A TELECOM CONSULTANT

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BY IAN ANGUS

Any organization considering changes to its telecommunications systems, especially acquisition of a new private branch exchange (PBX), faces a major problem: With every vendor claiming to be the best and the most advanced, how can you make a rational choice? Not only are there no performance benchmarks, there is not even a standard vocabulary. And there is certainly no rule that says a salesman has to tell the truth about his product.

In our firm's experience, the great majority of vendor proposals for major telecommunications systems are inaccurate or misleading in some substantial way, even when the vendor is not being deliberately deceptive. Buyers are faced with the problem of comparing apples and oranges.

Confronted with a confusing, rapidly changing marketplace and usually lacking the in-house expertise needed to make informed judgments, many firms decide to retain one of the 6,000 to 8,000 telecommunications consultants now practicing in the U.S. But this simply moves the apples and oranges problem back one step. All consultants are not alike.

Angus is president, Angus Telemanagement Group, Inc., Toronto, Ont. Canada.

There are no restrictions whatsoever on the use of the term "telecommunications consultant" by individuals or firms. There are no standard qualifications, no certification boards, no generally enforced ethical or professional standards.

A person with "telecommunications consultant" on his business card may be an ethical, highly qualified professional. But he may just as well be a PBX salesman, a representative of a call-detail recording service bureau or just an out-of-work salesman looking to pick up a few dollars to tide him over until his next real job comes through.

Even genuine consulting firms range from mediocre — or worse — to excellent. How, then, is the intelligent buyer to make a decision? How can you know when you are comparing apples and oranges?

There are no absolute answers. Even the most brilliant consultant will perform less than perfectly from time to time. This article offers some guidelines for managers selecting consultants. While there are no guarantees, following these guidelines will increase your chances of getting the right consultant for your needs.

The first step in obtaining professional assistance is to determine the nature ▶

and scope of the problem. When the consultant sits down with you for the first time, you should be able to answer the following questions:

- *What is the problem?* Are you considering a new system, reconfiguring an old one, conducting an audit, moving to a new location, trying to cut costs, integrating voice and data or developing a strategic plan?

Of course, your problem may be that you do not have the slightest idea what you need. You can hire a consultant to help with that problem, but be prepared for an open-ended and potentially expensive project.

- *What is the consultant to do?* Do you want a one-page report listing alternatives, total project management for a major acquisition or something in between? The scope of the project will be a major factor in determining the fee you pay, so define it carefully.
- *How large a system is involved?* How much do you spend each month on equipment, on toll and other usage charges and on voice and data? How many locations are involved? What type of system is in place in each location? How many stations and trunks are connected to each system? Will travel be necessary?
- *What is your timetable?* Do you have a schedule? How critical are your deadlines? What outside factors could affect the timetable for this project?
- *What resources do you have on hand?* Will the consultant be expected to do everything, or will your staff participate in the project? What expertise and experience do they have? How much time do they have available? How good are your billing and inventory records? Are they available centrally?

If you can answer these questions, you will save time for yourself and the consultant, and you will help ensure that you and the consultant have a common understanding of the project.

The Society of Telecommunications Consultants (STC) will send a list of its members to anyone who requests it. There are capable consultants who are not members of STC, but membership does show that the consultant adheres to the society's stringent Code of Ethics and meets minimum standards of competence. The list is available from STC, One Rockefeller Plaza, Suite 1410, New York, N.Y. 10020.

You can also find telecommunications consultants in the Yellow Pages under "Communications Consultants." This heading also includes telephone systems vendors and public relations firms, but it is a starting point. Some directories also have a "Telecommunications Consultants" heading, which also includes vendors.

Conferences, seminars, trade shows and conventions often feature presentations by consultants. Attending one of these sessions can offer the opportunity to hear the consultant and form a preliminary judgment without having to ask for a proposal.

And do not forget business contacts. Obtaining strong recommendations from people whose business judgment you respect is one of the best ways of creating a short list of possible consultants.

BEFORE YOU RETAIN a consultant in any field, you should obtain a clear, written description of the work to be done and the fees to be charged. This document becomes a contract between you and the consultant you choose. For a small project, with fees less than $7,500, you cannot justify the time and effort needed to obtain and review many large, complex proposals — and no consultant with an active practice can justify writing a major proposal. At that level, you should ask for a letter that contains at least the following:

- A description of the tasks to be performed;
- A discussion of the qualifications of the specific consultant assigned to this project;
- A list of clients for whom the consultant has provided similar services, who may be contacted for references.

On a larger project, you may wish to prepare a formal request for proposal, describing your requirements in detail. The request for proposal should include the answers to the questions above, as well as a discussion of your particular project and an outline of the criteria you will use in selecting a consultant. If you choose this route, expect to receive much more complex proposals and allow sufficient time for the consultants to prepare. A minimum of four weeks is advisable. Potential bidders should be given the opportunity to meet you and discuss the project several weeks before the proposals are due, and you should be available to answer questions by telephone. In addition to helping the consultant put together a realistic proposal, these preproposal contacts will help you obtain a clearer picture of the consultant's approach and fact-finding skills.

To a consultant, nothing is quite as difficult to deal with as

the proposal that vanishes into oblivion, leaving him uncertain as to whether he has been rejected or ignored — or if his proposal even reached the client. Please keep the bidders informed of the status of the project.

Even the best-written proposal can be misleading. You must be confident that you are selecting the right consultant in two senses:

■ *Is the consultant competent?* Can this firm or individual provide the services described?

■ *Is the chemistry right?* Will the individuals involved fit into your organization without unnecessary friction or personality clashes?

The proposal itself will provide important clues to the answers to these questions. An extreme case might be a consultant who provides no references. For example, one consultant may refuse to provide any references on the grounds of client confidentiality. While that consultant may be competent, the client has no way of checking and excludes the proposal outright. Some consultants, on the other hand, provide an extensive client list, allowing you to select the ones you wish to call. This should substantially increase your confidence in the value of the reference process.

Many clients assume that the inclusion of a list of references means that the references are good. This is a mistake. Even if previous clients have no substantial complaints, you may learn a great deal about the consultant's approach from them. Call the people listed and discuss the nature and quality of the work done.

You may also find it useful to check with other sources of information — the consultant liaison officers of major vendors, for example, or executive members of the telecommunications management organization in your area. These calls, together with a face-to-face interview with the consultant, should help you to evaluate the consultant on these points:

■ *Experience.* In addition to the consultant's overall experience in the telecommunications industry and in consulting, you may wish to investigate his experience in your particular industry, with systems of comparable size and complexity to yours and with the types

(Continued on Page 74)

The Proposal: Get It Straight

The following are some points to consider when first reading a formal consulting proposal.

■ *Overall quality of the proposal.* The proposal itself should be indicative of the consultant's competence: It should demonstrate the consultant's ability to organize ideas and concepts well, to present them clearly and professionally, without unnecessary jargon or confusion.

■ *Understanding of requirements.* The proposal should demonstrate a clear understanding of the nature of the project. A good proposal will demonstrate that the consultant has done some digging, going beyond your description of the problem, identifying key areas of investigation and possible solutions.

■ *Nature of approach.* How does the consultant propose to conduct the project? What information-gathering techniques will be used?

How many people will be involved and at what levels? Does the approach seem realistic? Will it fit into your organization's personality and structure? How thorough is the description of the tasks to be performed?

■ *Schedule.* Can the consultant meet your deadlines? If not, you will have to change the deadlines or go to a different consultant. Note, however, that consultant proposals often ask for generous lead times in order to simplify time planning. If the schedule is the only obstacle, many will make appropriate adjustments.

■ *Client involvement.* The best consulting project is one that involves and educates the client at all stages, so that reliance on the consultant is gradually reduced. The consultant should reach conclusions with you, not for you. Beware of the consultant who promises to do it all. On the other hand, be sure that you have the time and personnel needed to ensure the level of involvement the consultant suggests.

This first review should enable you to cut the list of possibilities down to a manageable number, perhaps three or four. These can be subjected to more intense analysis.

Your first reading may suggest that only one proposal is relevant to your needs. This may simplify the procedure — but it may also be a danger signal. You may have defined your list of chosen bidders incorrectly, or you may have defined your needs in an unnecessarily narrow way. Before you leap to a conclusion, you should subject your sole candidate to the same type of investigation that applies when there are five or six potential candidates.

— Ian Angus

Living with errors in computer communications is just another way to play Russian Roulette. Sooner or later something serious is bound to go wrong. Ask the major New York insurance broker where a one-digit miscommunication caused a $1,000,000 error in a client bill. Or the medical lab where a mistransmitted enzyme count came within minutes of costing a patient's life.

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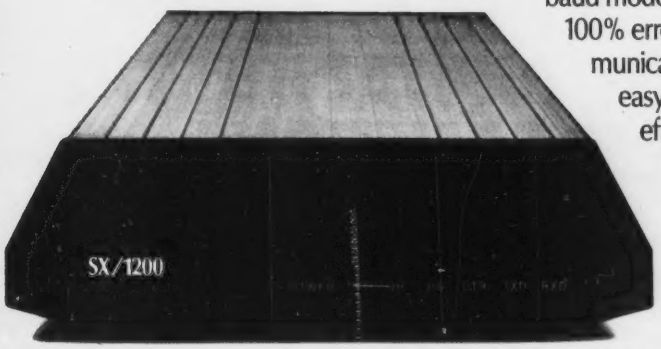

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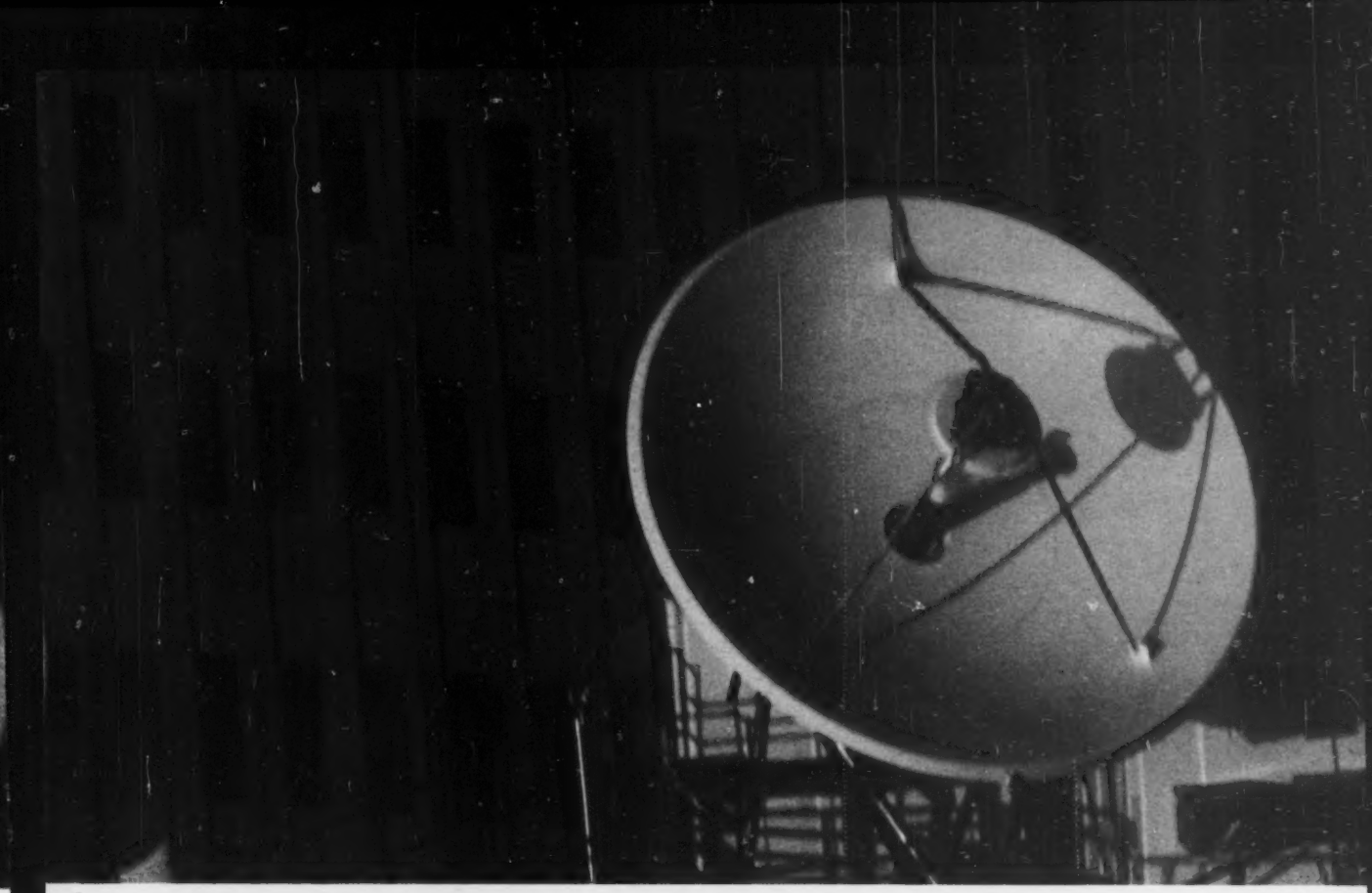


Others connect Digital equipment to IBM's SNA. More than just permitting communications, these gateways give your users direct access to both the batch and transaction processing environments of IBM mainframes.

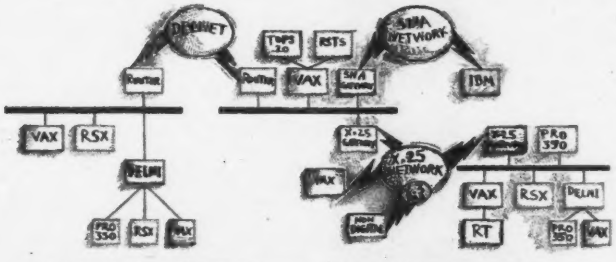
Digital networking products dramatically enhance the effectiveness of your distributed computing resources. They can be combined in almost endless ways to build a network comprised of just two nodes, or over a thousand. Users in the next

DECnet software keeps Digital networking simple. Simplicity keeps Digital networking reliable.

SETTING THE NETWORK STANDARD FOR EASE OF USE.

Digital believes that excellence in networking is best measured from the user's point of view. And by and large, communications on a Digital network is just plain automatic.

You can transfer files by simply noting the node of the



cubicle or on another continent can share information, applications and peripherals. They can integrate work at any level. Smaller systems gain access to the powerful capabilities of centralized facilities. Large systems can off-load tasks to smaller dedicated systems.

receiver. You can reach, via DECmail™ software, any number of people just by naming them. With DATATRIEVE™ software you can sort and report information without regard for how and where it is filed.

To the user, how it all happens is of little or no concern. User commands remain consistent across operating systems, across distances supported by DECnet and despite the fact that your message might travel by fiber optic cable, private or public lines, and then by satellite link.

DIGITAL WILL GO TO GREAT LENGTHS TO BUILD YOUR NETWORK.

With Digital software, no proposed network use is too unlikely. No combination of technologies is out of the question. And because Digital maintains service centers in every corner of the world, no remote node is too remote.

Digital will design, install, help manage and constantly evaluate the state of your network. You, your users, your future data communications management can all be Digital-trained. Digital will give you round-the-clock support with guaranteed service and warranteed product performance.

Most of all, Digital will provide you with networking solutions so open-ended they will instill you with confidence about the most far-reaching computing decision you face.

BEST ENGINEERED MEANS ENGINEERED TO A PLAN.

Digital networking products, like every Digital hardware and software product, are engineered to conform to an overall product plan. This means Digital systems are engineered to work together easily and expand inexpensively. Only Digital provides you with a single, integrated computing strategy direct from desktop to data center.

For a copy of the brochure, "Digital: Tomorrow's Networks Today," call 1-800-DIGITAL. Or write: Digital Equipment Corporation, Attn: Media Response Manager, 200 Baker Avenue, West Concord, Massachusetts 01742.

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(Continued from Page 71)

of technology — voice, data, image, microwave and so on — you are considering.

■ *Pragmatic approach.* Obviously, you want to avoid consultants who are "on the take" or otherwise committed to a single vendor. But the knowledgeable client looks beyond such formal concerns to a deeper one: the tendency of some consultants to adopt a standard approach or a standard solution, regardless of the client's real needs. A good consultant has a pragmatic approach, applying appropriate technology to problems, not forcing clients to fit into preconceived patterns.

■ *Ethics.* Does the consultant adhere to the code of ethics of the STC or some comparable body?

■ *Management.* Has the consultant demonstrated the ability to manage projects of this nature and size? Has he completed previous projects on time? Has he completed them within the forecasted fee limit? If not, why not?

■ *Concern for detail.* Is the consultant only interested in the big picture or has he shown willingness and ability to do intensive detailed investigation and analysis? Telecommunications catastrophes are more often the result of overlooked details than of major architectural problems.

■ *Current knowledge.* What steps does the consultant take to ensure that his knowledge is current and accurate? Does he participate in the STC's consultant education programs? Is he a participant in the consultant liaison programs run by major manufacturers?

■ *Standing in industry.* What is the consultant's standing in the industry? This may be demonstrated by publication in major periodicals, participation in professional organizations, invitations to present papers to major conferences and so on.

■ *Staff.* If this is a one-consultant firm, can one person simultaneously handle this project and others? Will you get the support you need, when you need it? On the other hand, if this is a larger firm, what are the qualifications of the specific consultants who will be involved? Will you get personal attention and commitment, and will you have access to the firm's principals when you want it?

In evaluating the consultant, it is important to remember that competence is only the minimum requirement. Ideally, you want excellence. An "okay" reference is just a passing grade. You should be looking for a consultant whose former clients are enthusiastic about the quality of service they received and recommend the firm without reservation.

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Fees are not easy to compare. A low consulting fee is attractive — but it may reflect a low level of effort or expertise, which can translate into higher total project costs or a poorly done project.

This does not mean that you should always select the highest fee quoted. Some proposals are padded with unnecessary staff and duplicated work, and some firm's fees are far out of line. But the fact remains: In most cases you get what you pay for. A lower fee frequently hides a lower level of effort.

There are various types of consulting fees. In telecommunications, the following are the most common:

■ *Daily or hourly fees.* These are usually quoted with an estimate of the total to be charged and billed monthly.

■ *Project fees.* A flat charge for the entire project, billed in stages on completion of milestone tasks or at the end of the project.

■ *Contingency fees.* A percentage charge, usually based on dollar savings to the client. This arrangement is frowned on by most consultants — except for basic billing audits — because the telecommunications savings are hard to define and harder to prove.

When the relationship is to be long-term, involving a variety of tasks and projects, a retainer fee may be considered appropriate.

Micro-to-mainframe:
Before you settle for a simplistic solution, ask a few serious questions.
Choosing a micro-to-mainframe communications system is no game.
So before you toy around with "easy" solutions, ask some serious questions.
Will this product support full IBM Terminal Emulation?
Make sure the system can emulate remote batch and interactive IBM terminal systems.
Does the company offer a variety of products?
You should have your choice of stand-alone front-end processors, IBM PC or XT boards, or an OEM board. All ready to run on the most popular operating systems.
Can I get fast answers to my questions?
Insist on toll-free access to qualified service personnel before and after the sale.
What if I need a quick analysis of a problem?
Ask if the manufacturer has a Communications Test Center for product testing over public phone lines. And find out if the system has internal diagnostics.
Suppose something goes wrong with the unit?
The company should offer a 30 day money-back guarantee and a 12 month warranty that includes a free replacement unit.
What about future product development?
Make sure the products you're going to need soon will be available soon.
Who am I dealing with anyway?
How long have they been in business? The longer, the better.
How much is all this going to cost?
Here's a point of reference: Our own DataTalker product line will give you all the capabilities and services just described for as little as $695. Complete. If you'd like to know more, contact our Marketing Support Group at 1-800-321-7785.
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DataTalker™
By Winterhalter, Incorporated
Winterhalter, Incorporated has been providing data communications solutions to major manufacturers of microcomputers and word processors since 1978. Our DataTalker front-end processors and PC boards are used by companies around the world, from start-up manufacturers to the Fortune 1000.
NASDAQ SYMBOL WINT.
Now available for the IBM PCjr.

Some consulting firms guarantee a certain level of availability in exchange for a retainer.

They may also agree to lower hourly rates because the retainer allows them to manage their cash flow more efficiently.

You should expect the proposal to include an estimate of the total consultant time and the resulting fees, together with an estimate of billable expenses. On a large project, a phase-by-phase breakdown of consultant time, by person and by task, will help you detect padding or unnecessary tasks.

A consultant may separate optional activities that could be added. If such a separation is made, it should be clear what the costs of the options are and what benefits could be derived from them.

On a large project, a careful consultant will define issues of scope in detail, stating precisely what is included and what is not. Just as clients have been burned by consultants who reneged on promises, so every consultant can tell war stories about clients who decided to change the project definition in midstream, but expected it to be completed on the same schedule for the same fee.

By taking the time to ensure that you and the consultant have a common understanding of the nature and scope of the project, you can reduce the danger of fees that exceed the forecast maximum or projects that are never completed.

CURRENT DAILY rates range from $500 to $1,500 and higher for some well-known consultants. At the low end of that range, you can expect a relatively inexperienced consultant or one just starting in practice who is trying to establish a client base. At the upper end, you should expect and insist on a senior consultant, probably a principal of the firm with a substantial reputation and demonstrated competence.

When evaluating the per diem or hourly rate, bear in mind that a consultant with a strong commitment to self-education may devote as much as 25% of his time to unpaid activities, including reading, seminars, conferences and so on.

An unusually low daily rate is only possible if the consultant has a high number of billable days each month. Such a consultant may not be taking the time to keep abreast of current developments in the industry.

Some consultants prefer to quote flat-rate project fees, without a breakdown of time and charges. While this allows you to budget effectively, it may make it difficult for you to determine from the proposal exactly what tasks will be performed and at what level of effort.

As a result, many clients prefer a daily or hourly rate that has a ceiling — and experienced clients understand that such a ceiling must be flexible enough to allow for potential changes in the scope of the project.

How large will the total fee be? In the past, it was common to take a figure of 8% to 10% of the project cost as a good guideline for a consulting fee ceiling. This was acceptable when the telecommunications industry was composed of a few large telephone companies providing comprehensive service.

Today, there are thousands of firms in the business, all trying to cut costs by cutting customer service; and with the daily appearance of new firms with little experience in customer service, the fee for a consulting project may be higher than the traditional norm, because the consultant must perform tasks that were often left to the vendors in the past.

If the consultant must design the system's data base, prepare training materials or conduct a physical audit of installed equipment, the cost will be higher than the traditional 8% to 10%. This applies with particular force for projects involving equipment, systems and services from several different vendors.

If your preferred consultant has quoted a fee that is completely out of your budget's reach, you may be able to work with him to redefine the project so that the fee is lower.

It may be possible, for example, to have your own staff undertake some of the work.

One of the worst mistakes a client can make is to abdicate responsibility to the consultant — to turn the project over to an outsider and walk away.

No matter how busy you are, no matter how uncomfortable with the subject matter, it is a manager's duty to manage, to be sure that the project is conducted properly and that the organization learns and grows through the experience.

The same applies to the process of selecting the consultant. A manager who chooses a consultant on price alone is abdicating his responsibilities. There is no alternative to doing the job properly, with appropriate concern for detail, the first time out. If you take the time and make the effort to do that, the experience should be a positive one, for you and the consultant. ■

WILL THE AT&T BREAKUP MEAN AN MIS SHAKEUP?

You'll know, when you view
"DIVESTITURE: IMPACT ON INFORMATION MANAGEMENT"
Exclusively from
DELTAK's Special Edition:
Computerworld Reports.

The AT&T divestiture is undoubtedly the most earthshaking event in recent business history. The repercussions will be felt throughout the telecommunications industry for many years to come. It will also profoundly change the way your company processes all forms of information. That's why you owe it to yourself to watch "Divestiture: Impact on Information Management," an up-to-the-minute half-hour video cassette report presented by DELTAK and CW Communications.

This month, you'll enjoy the invaluable insights of a respected communications consultant, and a major communications vendor whose company may benefit from the recent breakup. Your program host is John Gantz, noted MIS author and contributing editor of INFOWORLD magazine.

And be sure to keep watching, because more hard-hitting issues of Computerworld Reports such as DP/Office Automation Integration and The Maturing Information Center will be coming in the months ahead. Or, previously released Reports addressing major issues are still available including: The MicroMainframe Link, Integrated Microcomputer Software and Managing the Communication Network.

Remember, before the Big Breakup shakes your information system up, order "Divestiture: Impact on Information Management." Call DELTAK order entry at (312) 369-3000; (416) 678-9222 in Canada.

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Management Tool Aids Centrex Users

AT&T Technologies took the wraps off software designed to provide Centrex users with communications management and office automation capabilities.

The Advanced Communications Package runs only on the AT&T 3B computer. The package is loaded into the central office 3Bs used to switch Centrex calls. A 3B can be installed on the customer premises and the package used for general processing and office automation in addition to communications management.

The package offers two groups of options: the Communications Manager and the Office Manager. The Communications Manager provides a variety of reports on system usage and management that may lead to reduced phone calling abuse. It provides a user-friendly system to make changes in telephone numbers or services on the customer's premises.

A Customer Message Center provides a centralized message system. With it, information on the called number is available from a central answering point.

An electronic key function allows users to activate all Centrex features with a single button rather than a dialing code. It also reportedly reduces the need for multiline wiring.

For customers that choose to have a 3B installed on premises, the two-module Office Manager is said to provide full integration of telecommunications system management and general processing.

Epic (Executive Planning, Information and Communications) is the first module. This office automation system utilizes a teleterminal to provide enhanced calling services, electronic messaging, information retrieval capabilities and personal calendar keeping.

The second module, General Processing, provides such Unix operating system features as Workbench software.

The Advanced Communications Package will be available during the third quarter of this year from the Bell operating companies. At press time, the price had not been determined.

AT&T Technologies, 222 Broadway, New York, N.Y. 10038.

Primenet Enhanced, Local Net Plan Unveiled

Prime Computer, Inc. has enhanced Primenet, its distributed networking facility; extended its local office network capabilities; and announced its intent to develop an Ethernet-like local-area network.

Revision 19.3 of Primenet reportedly provides increased network performance connectivity and management facilities that are free to current users. Those facilities include the ability for one node to converse transparently through an intermediate gateway node with remote network systems. Another facility allows each network node to support up to three synchronous lines, one of which can operate at speeds up to 56K bit/sec.

Some of the Primenet enhancements were realized by extending the capabilities of Ringnet, the company's token-ring network designed to interconnect Prime Series 50 computers locally.

Ringnet enhancements bundled into the Primenet upgrade include new utilities that reportedly provide a dynamic display of network activity for each node, as well as an increase, from 16 to 128, in the maximum number of Prime hosts that can be accommodated on a single Ringnet.

A repeater that doubles the possible distance between Ringnet nodes from 750 to 1,500 feet using coaxial cable or 3,280 feet using fiber-optic cable, was also unveiled. The coaxial repeater costs $3,000 and the fiber-optic version, $5,000.

In announcing the development of an Ethernet-like local-area network, the firm said it would adhere to international standards and be integrated with Primenet.

The original license fee for Primenet is $7,500; subsequent licenses are $5,000 each.

Prime Computer Inc., Prime Park, Natick, Mass. 01760.

Ethernet Extended To Emulate IBM Devices

Xerox Corp. is making Ethernet, its local-area network, compatible with IBM computers running under IBM's Systems Network Architecture (SNA) by allowing them to emulate IBM devices. It is also allowing IBM Personal Computers to access Ethernet, its local-area network.

In addition, Xerox unveiled a remote batch computer service on Ethernet for document interchange among computer systems from other vendors.

One of the new communications features allows Xerox 8010 Star professional workstations to

Give your PC some exciting new personalities.

Our EtherGuide™ seminar-on-a-diskette will show you how.

This diskette seminar demonstrates how easy it is to get into personal networking. With 3Com's EtherSeries.™ The effect is dramatic. Instead of a solid, useful, but limited business assistant, your PC shows its true potential.

In a local area network, you and your PC take on a series of exciting new personalities. You become a better business consultant, secretary, messenger, meeting planner, graphic artist, author, financial analyst, executive, and friend.

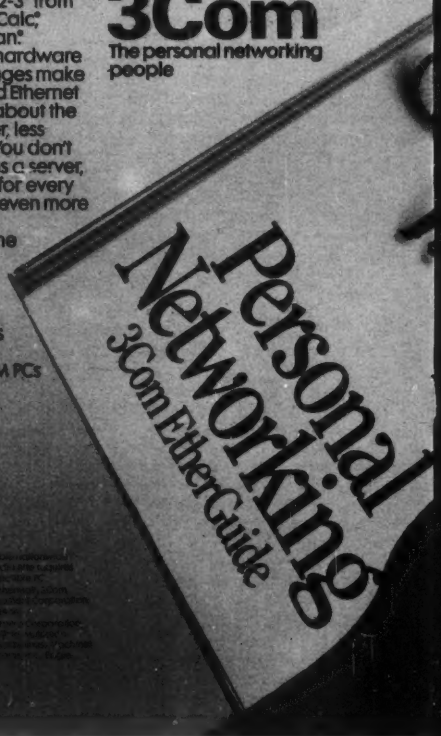
You'll be able to reach out to colleagues with electronic mail, using our award-winning EtherMail.® Share data bases, printers and plotters, while running hundreds of leading programs such as 1-2-3® from Lotus,® WordStar,® VisiCalc,® dBase II® and MultiPlan.®

Our EtherSeries hardware and software packages make the industry-standard Ethernet even better. And it's about the same price as slower, less powerful networks. You don't have to tie up a PC as a server, either. Or buy a disk for every PC. So that saves you even more money.

No wonder it's the choice of Hewlett-Packard, Texas Instruments and Zenith for their own network products. As well as hundreds of companies using IBM PCs and most compatibles, such as COMPAQ,® TeleVideo® and Eagle.®

So find out how easy it is to get into personal networking. Send in the coupon and a check for $10—that's $10 off the usual $20 price. Or just check the box for complete information on how to do your personal best.

3Com
The personal networking people



emulate IBM 3278 CRT terminals, providing compatibility with SNA protocols. Using the workstation's technique of multiple display windows, a user can display as many as six 3278 windows and simultaneously access up to six different programs or mainframes running under SNA.

A Xerox spokesman said it is providing the direct hardware connection to Ethernet with 3Com Corp., a supplier of Ethernet hardware and software.

Xerox and 3Com are also jointly developing protocol software that will reportedly allow an IBM Personal Computer user to edit a document on the IBM Personal Computer, then access Ethernet network services for electronic printing, filing, electronic mail and mainframe access.

The remote batch service product is designed to provide multivendor document exchange. It supports IBM 2770, 2780 and 3780 communications protocols as well as flexible document format conversion.

The SNA option, as well as Digital Equipment Corp.'s VT-100 emulation and remote batch service, will be available in October. Prices for the products will range between $200 and $1,500, Xerox said.

The kit to connect the IBM Personal Computer to Ethernet costs $795.

Office Systems Division, Xerox Corp., 3333 Coyote Hill Road, Palo Alto, Calif. 94304.

Compatibility Tools Out For Wang, IBM Micros

Wang Laboratories, Inc. unveiled hardware that reportedly allows the Wang Professional Computer to run IBM Personal Computer software. The firm also introduced an option for the IBM Personal Computer that makes it Wang-compatible.

The Wang/IBM Emulation Control Board is said to emulate IBM's Personal Computer monochrome card and permit the Wang Professional personal computer to accept off-the-shelf IBM software that runs in monochrome text mode.

According to a Wang spokesman, "most" popular personal computer programs will run on the Professional without modification and twice as fast as on the IBM machine.

It will be available in September for $595.

The Wang System Network option for the IBM Personal Computer — consisting of a communications board and associated software — permits Personal Computers to connect to Wang VS systems and participate in Wang networking.

The Personal Computer can either attach as a VS workstation or transfer files to and from the VS, with files downloaded by a VS print facility, the spokesman said.

The package will be available in the second quarter of 1985 for $1,850, Wang said.

Wang Laboratories, Inc., One Industrial Ave., Lowell, Mass. 01851.

Pathway Enhances Micro-to-CPU Links

Pathway Design, Inc. unveiled two enhancements to Pathway Design Systems Network Architecture (SNA)/3270 and 3770 micro-to-mainframe links that are said to increase the functionality of the IBM Personal Computer, the Wang Laboratories, Inc. Professional and Sperry Corp.'s Sperry Personal Computer.

User exits and data redirection allow users to execute DOS facilities and personal computer applications during micro-to-host communications and to direct data to the disk in a 3270 interactive mode. For interactive processing, SNA/3270 allows users to make inquiries, view or print host information, exit to a local personal computer application and then return to the communications session at the point of departure.

The Pathway Design/SNA and Binary Synchronous Communications products are priced at $595.

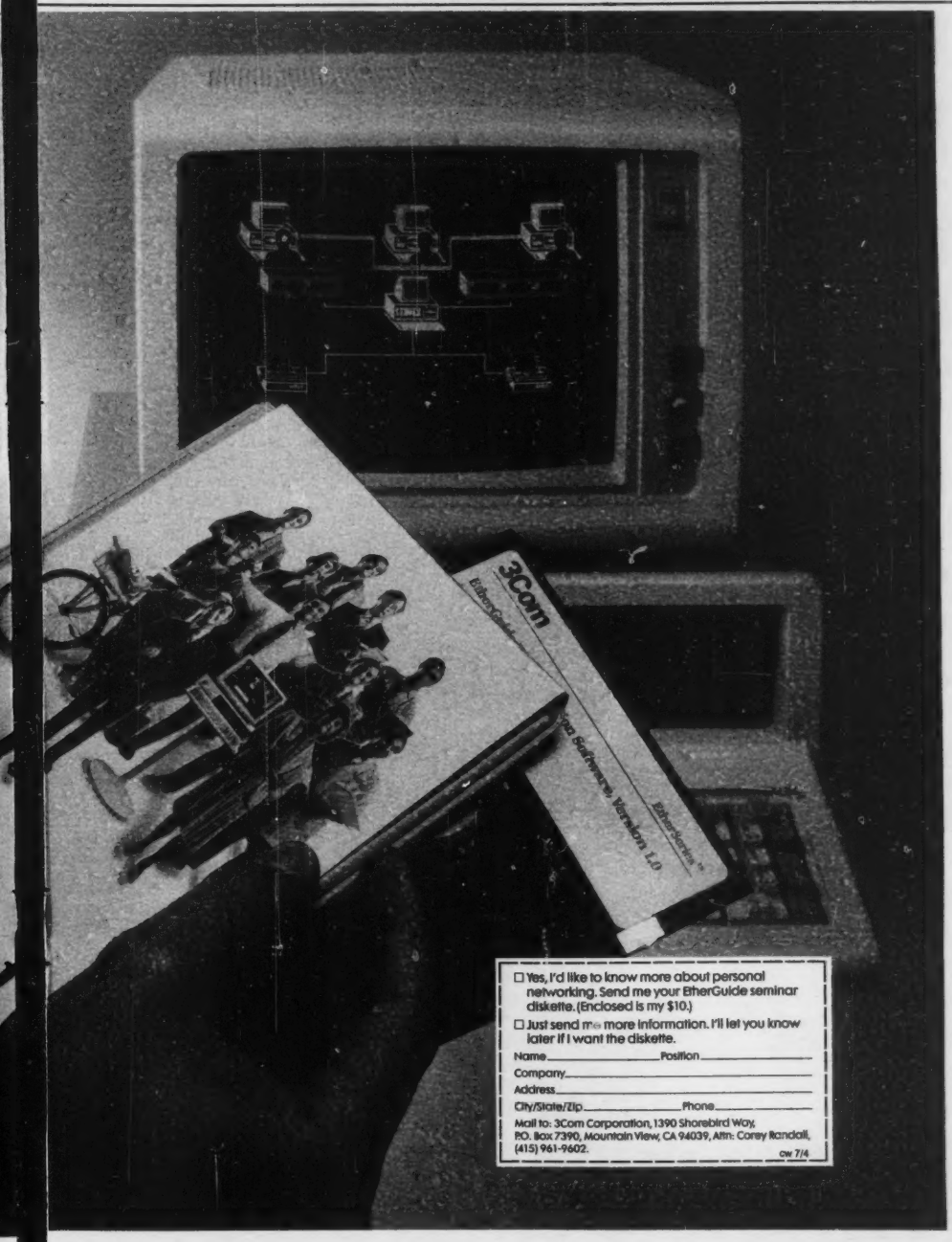
Pathway Design, Inc., 177 Worcester St., Wellesley, Mass. 02181.

Irma Family Grows

Digital Communications Associates, Inc. announced seven Irma line additions, reportedly providing IBM Personal Computer users micro-to-mainframe interfacing abilities.

The Irma package is priced at $1,195, and the additions are:

- Irmaline is said to allow an IBM Personal Computer or asynchronous terminal user to communicate with a long-distance mainframe via a local IBM 3270 controller. It costs $1,295.
- Irmalette, when used in conjunction with Irmaline, reportedly provides the capabilities of Irma to remote users. It costs $395.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cw 7/4

PRODUCTS

■ Irmaprint reportedly allows asynchronous Ascii output devices to operate as output peripherals on IBM 3270 networks. It costs $1,295.

■ Irmacom is said to offer the IBM Personal Computer user an assortment of emulation capabilities. It is priced at $895.

■ Irmakey/3270 reportedly looks exactly like an IBM 3270 Personal Computer keyboard, but features four additional Irma function keys. It will be available in August and sells for $329.

■ Irmalink/CICS reportedly permits the transfer of files between an IBM mainframe running under DOS/VSE and CICS, or MVS and CICS, and a microcomputer running under MS-DOS 2.0 or Personal Computer DOS 2.0. The mainframe portion costs $9,995, while the diskettes for each Personal Computer cost $400 to $500.

■ Irmalink/TSO is a file transfer package designed to run with Irma or Irmalette. Irmalink/TSO is available for a one-time handling fee of $100.

Digital Communications Associates, Inc., 303 Technology Park, Norcross, Ga. 30092.

DFMS Provides Net Management

Northern Telecom, Inc. introduced a Digital Facility Management System (DFMS) said to automate digital facility maintenance and administration.

The DFMS is reportedly designed for large metropolitan-area digital communications networks and will support as many as 12 operator positions. These positions can be used for any combination of test, administration and data base editing functions.

According to the vendor, the DFMS monitors digital facility alarms and T-carrier spans to warn operators of trouble by means of audio and visual displays.

The price for the DFMS ranges from $50,000 to $2.5 million, depending on system configuration.

Northern Telecom Inc., 1 Vantage Way, Nasbville, Tenn. 37228.

Netmaster Allows SNA Conversion

Innovative Electronics, Inc., announced a 16-bit computer and microprocessor-based concentrator that reportedly provides IBM Systems Network Architecture (SNA) conversion to NCR Corp. or Burroughs Corp. Poll/Select.

The Netmaster functions as a remote in-store processor in a credit card authorization or data entry network system. It also operates in conjunction with an IBM SNA host with a 3705/25 front-end processor and one or more NCR-to-Burroughs controllers connected to point-of-sale terminals, the vendor said.

Price for the basic unit is $3,200, and quantity discounts are available.

Innovative Electronics, Inc., 4714 N.W. 165 St., Miami, Fla., 33014.

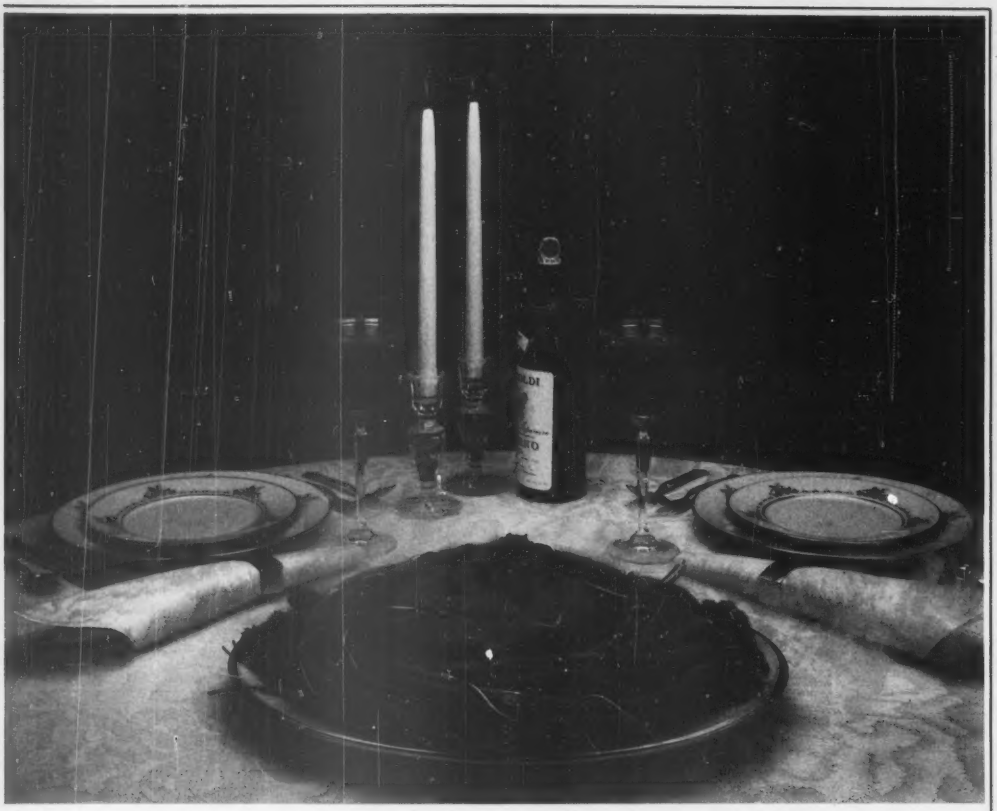
Management Tool Runs on DEC VAX

Digital Equipment Corp. has announced Telepro, a software management tool said to provide telecommunications and finance managers with information on the use of private branch exchanges (PBX). Telepro is available for DEC's VAX and PDP-11 computer systems.

Reportedly developed to operate with a PBX with attached station message detail recorder (SMDR), Telepro generates cost-allocation and traffic management reports. It runs under the DEC VAX/VMS Version 3.4 and RXS-11M Version 4.0 operating systems.

Telepro is priced at $7,700 for RSX-11M and $12,700 for VAX/VMS operating systems.

Digital Equipment Corp., Maynard, Mass. 01754.



ABLE's ATTACH customers enjoy their spaghetti in the dining room, not the computer room.

ABLE's ATTACH, the breakthrough multi-host terminal switching system for DEC UNIBUS computers that eliminates the spaghetti-like mess of cables in your computer room.

One ATTACH host board and a *single* cable replaces 16 DEC interfaces, and their associated "spaghetti." And it still supports up to 128 terminals on your system without the endless tangle of cables that tie-up your computer room.

One ATTACH host board does the work of many multiplexers. The immediate advantage is a dramatic reduction in mounting space and expansion cabinetry, resulting in significant cost savings. And ATTACH can be located up to a kilometer away from your computer room.

Cook up a system to meet your present data communication requirements with ATTACH. At the touch of a keyboard, terminals can be dynamically *switched* among any combination of VAX and PDP-11 UNIBUS systems. And, ATTACH is compatible with RSX, RSTS/E, VMS and UNIX operating systems.

Expanding your capabilities, or adding terminals is easy with ATTACH. As your requirements grow, simply add modular ATTACH units to your system.

Whether you have 28, or 128 or more terminals, ATTACH has the right recipe for cost-effective connectivity.

ABLE Computer's ATTACH is the most efficient terminal interconnection system on the table.

Contact the ABLE representative near you, or call ABLE toll-free at 800-332-2253.

ABLE COMPUTER

The communication specialists

1732 Reynolds Avenue, Irvine, California 92714. In the Irvine area: (714) 979-7030. Or, TWX: 910-595-1729.

DEC, PDP, RSTS, RSX, UNIBUS, VAX and VMS are trademarks of Digital Equipment Corporation. UNIX is a trademark of Bell Laboratories. ATTACH is patent pending.

CALENDAR

JULY 11-13, HASBROUCK HEIGHTS, N.J. — *Data Communications.* Also, July 25-27, Houston. Contact: Center for Advanced Professional Education, 1820 E. Garry St., Suite 110, Santa Ana, Calif. 92705.

JULY 12, NASHVILLE, TENN. — *How To Manage Assertively.* Contact: Fred Pryor Seminars, Inc., 2000 Johnson Drive, P.O. Box 2951, Shawnee Mission, Kan. 66205.

JULY 12-13, LAS VEGAS — *IBM Futures — The Next Ten Years.* Contact: Carol Pettie, Gartner Group, Inc., 72 Cummings Point Road, P.O. Box 10212, Stamford, Conn. 06904.

JULY 16-17, SAN FRANCISCO — *Data Communications II: Advanced Concepts, Products and Services.* Also, July 23-24. Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

JULY 16-20, SAN DIEGO — *Data Communications.* Contact: Data Communications Special Projects Conference Management Center, Information Breakthrough, Inc., 445 W. Main St., Wyckoff, N.J. 07481.

JULY 16-20, LAS VEGAS — *How To Develop An Effective Long-range Data Processing Plan.* Contact: Dr. Robert Keston, Keston Associates, 11317 Old Club Road, Rockville, Md. 20852.

JULY 17, PALO ALTO, CALIF. — *Strategic Information Systems for Competitive Advantages.* Contact: High Technology Management Group, 850 Boylston St., Suite 420, Chestnut Hill, Mass. 02167.

JULY 17-18, WASHINGTON, D.C. — *PBXs vs. LANs: Selecting Your System.* Contact: Architecture Technology Corp., P.O. Box 24344, Minneapolis, Minn. 55424.

JULY 17-19, NEW YORK — *Telephone Systems: Their Selection, Operation and Management.* Contact: Institute For Advanced Technology, 6003 Executive Blvd., Rockville, Md. 20852.

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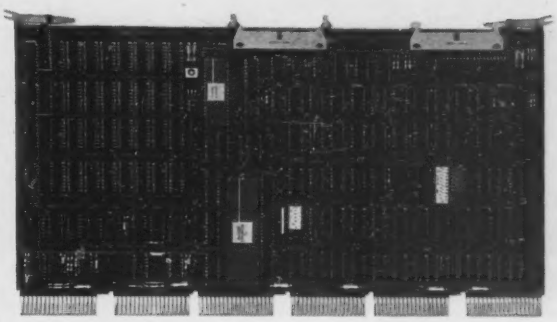

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EXIT

Alan Danis throws up his hands at frozen cursors.

Alan Danis, above, is a healthcare consultant in Boston. He recalls a distinctly non-user-friendly night.

Most of my distrust of computers is caused by their lack of visible moving parts and my inability to distinguish between computer mechanical failures and my self-perceived incompetence as an operator.

I prefer using machinery that accepts responsibility for some sort of mechanical problem by alerting me to current or potential operating problems through warning lights or instructions on how to correct specific malfunctions.

I confirmed this preference recently after an unfortunate encounter with some recalcitrant hardware.

Late one night after inputting three hours worth of data, something happened. Something bad. I either inadvertently pressed the wrong combination of keys or some mystical mechanical failure caused my cursor to freeze in the middle of the screen.

I panicked, since I could not exit the screen or the data entry mode and had not saved the file. I quickly identified the fact that there was a problem and that I was not skillful enough to solve it myself.

I immediately called two operators with more experience, neither of whom had encountered this particular problem.

These people were consistent in their advice: Call other, more experienced operators or consult the operating manual. The operating manual index did not reference "frozen immobile cursor" and did not even acknowledge "trouble" conditions.

I unsuccessfully attempted random key pressing, disconnecting and reconnecting various system component connectors and finally pressing the control reset button. This action yielded limited success, in so far as the machine did respond.

The result, however, was the shrinking of my data file to a 1-in. square on the screen. Finally, I rebooted and reentered the entire data file.

The lesson I learned from this is that most computer operating manuals imply that all failures are operator-related, instilling the notion that computers are not subject to mechanical failure.

Computer advertising efforts appear to be directed at a nonexpert market, yet most operating instructions do not identify common mechanical problems and their solutions.

Somehow, I would feel more comfortable using a machine that acknowledges that both it and I are capable of failing in a joint effort.

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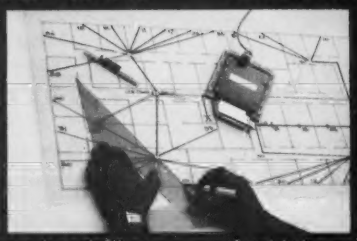

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